A330

AIRCRAFT RECOVERY MANUAL

ARM

AIRBUS S.A.S.
Customer Services
Technical Data Support and Services
31707 Blagnac Cedex
FRANCE

Issue: Jul 30/93 Rev: Oct 01/11

HIGHLIGHTS

Revision No. 11 - Oct 01/11

LOCATIONS	CHG CODE	DESCRIPTIONS OF CHANGE
CHAPTER 01		
Subject 01-20-01		
DESC 01-20-01-002-A01	R	NOTE AMENDED
CHAPTER 02		
Subject 02-30-01		
TASK 02-30-01-200-801-A01	R	
Subject 02-40-01		
DESC 02-40-01-001-A01	R	WARNING CAUTION ADDED/REVISED/DELETED
CHAPTER 03		
Subject 03-50-01		
DESC 03-50-01-002-A01	R	NOTE AMENDED
Subtask 03-50-01-558-014-A01	R	NOTE AMENDED
Subtask 03-50-01-558-014-B01	R	NOTE AMENDED
CHAPTER 04		
Subject 04-80-13		
TASK 04-80-13-869-801-A01	R	TOOL P/N AND/OR DESIGNATION ADDED/REVISED/DELETED CROSS REFERENCED MANUAL(S) ADDED/REVISED/DELETED
CHAPTER 05		
Subject 05-40-02		
TASK 05-40-02-650-801-A01	R	
Subject 05-40-03		
TASK 05-40-03-650-802-A01	R	
CHAPTER 06		
Subject 06-30-00		
TASK 06-30-00-581-801-A01	R	

LOCATIONS	CHG CODE	DESCRIPTIONS OF CHANGE
Subtask 06-30-00-581-002-A01	R	NOTE AMENDED
Subject 06-40-00		
DESC 06-40-00-001-A01	R	CROSS REFERENCED DOCUMENTARY UNIT ADDED/REVISED/DELETED
CHAPTER 07		
Subject 07-40-04		
DESC 07-40-04-001-A01	R	
CHAPTER 09		
Subject 09-10-11		
DESC 09-10-11-001-A01	R	NOTE AMENDED
FIGURE 09-10-11-991-001-A01	R	ILLUSTRATION REVISED
Subject 09-20-01		
FIGURE 09-20-01-991-001-A01	R	CHART REVISED
FIGURE 09-20-01-991-005-A01	R	CHART REVISED
FIGURE 09-20-01-991-006-A01	R	CHART REVISED
FIGURE 09-20-01-991-007-A01	R	CHART REVISED
FIGURE 09-20-01-991-008-A01	R	CHART REVISED
FIGURE 09-20-01-991-009-A01	R	
FIGURE 09-20-01-991-010-A01	R	CHART REVISED
FIGURE 09-20-01-991-011-A01	R	CHART REVISED
FIGURE 09-20-01-991-012-A01	R	CHART REVISED
FIGURE 09-20-01-991-013-A01	R	CHART REVISED
FIGURE 09-20-01-991-014-A01	R	CHART REVISED
FIGURE 09-20-01-991-015-A01	R	CHART REVISED
Subject 09-30-02		
DESC 09-30-02-001-A01	R	CROSS REFERENCED DOCUMENTARY UNIT ADDED/REVISED/DELETED

LIST OF EFFECTIVE CONTENT

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CONTENT	CHG CODE	LAST REVISION DATE
Subject 02-20-01		
TASK 02-20-01-285-801-A01		Nov 01/09
Subtask 02-20-01-284-001-A01		Nov 01/09
Subtask 02-20-01-680-001-A01		Nov 01/09
Subtask 02-20-01-862-001-A01		Nov 01/09
Subtask 02-20-01-869-001-A01		Nov 01/09
Subject 02-20-02		
TASK 02-20-02-285-801-A01		Nov 01/09
Subtask 02-20-02-285-001-A01		Nov 01/09
Subtask 02-20-02-285-002-A01		Nov 01/09
Subtask 02-20-02-500-001-A01		Nov 01/09
Subtask 02-20-02-869-001-A01		Nov 01/09
Subject 02-30-01		
TASK 02-30-01-200-801-A01	R	Oct 01/11
Subtask 02-30-01-867-001-A01		Nov 01/09
Subtask 02-30-01-867-003-A01		Nov 01/09
Subtask 02-30-01-867-004-A01		Nov 01/09
FIGURE 02-30-01-991-001-A01		Nov 01/09
FIGURE 02-30-01-991-002-A01		Nov 01/09
TASK 02-30-01-481-802-A02		Nov 01/09
Subtask 02-30-01-869-003-A01		Nov 01/09
Subtask 02-30-01-481-004-A01		Nov 01/09
Subtask 02-30-01-481-005-A01		Nov 01/09
FIGURE 02-30-01-991-024-A01		Nov 01/09
FIGURE 02-30-01-991-026-A01		Nov 01/09
TASK 02-30-01-867-803-A01		Nov 01/09
Subtask 02-30-01-869-001-A01		Nov 01/09
Subtask 02-30-01-581-001-A01		Nov 01/09
Subtask 02-30-01-581-002-A01		Nov 01/09

CONTENT	CHG CODE	LAST REVISION DATE
FIGURE 02-30-01-991-020-A01		Nov 01/09
FIGURE 02-30-01-991-021-A01		Nov 01/09
FIGURE 02-30-01-991-022-A01		Nov 01/09
Subject 02-40-01		
DESC 02-40-01-001-A01	R	Oct 01/11
CHAPTER 03		
Subject 03-00-00		
TASK 03-00-00-558-801-A01		Apr 01/10
Subtask 03-00-00-558-001-A01		Nov 01/09
Subtask 03-00-00-558-001-B01		Nov 01/09
Subtask 03-00-00-970-001-A01		Nov 01/09
FIGURE 03-00-00-991-002-A01		Nov 01/09
FIGURE 03-00-00-991-002-B01		Nov 01/09
Subject 03-20-01		
DESC 03-20-01-001-A01		Nov 01/09
FIGURE 03-20-01-991-001-A01		Nov 01/09
FIGURE 03-20-01-991-001-C01		Nov 01/09
DESC 03-20-01-002-A01		Nov 01/09
Subject 03-20-02		
TASK 03-20-02-970-801-A01		Apr 01/10
Subtask 03-20-02-869-001-A01		Apr 01/10
Subtask 03-20-02-970-004-A01		Nov 01/09
FIGURE 03-20-02-991-002-A01		Nov 01/09
FIGURE 03-20-02-991-004-A01		Nov 01/09
Subject 03-50-01		
DESC 03-50-01-001-A01		Apr 01/10
DESC 03-50-01-002-A01	R	Oct 01/11
FIGURE 03-50-01-991-003-A01		Nov 01/09
FIGURE 03-50-01-991-003-C01		Nov 01/09

CONTENT	CHG CODE	LAST REVISION DATE
FIGURE 03-50-01-991-004-A01		Nov 01/09
FIGURE 03-50-01-991-004-C01		Nov 01/09
FIGURE 03-50-01-991-005-B01		Nov 01/09
TASK 03-50-01-558-803-A01		Nov 01/09
Subtask 03-50-01-558-003-A01		Nov 01/09
TASK 03-50-01-558-804-A01		Nov 01/09
Subtask 03-50-01-558-004-A01		Nov 01/09
Subtask 03-50-01-558-004-B01		Nov 01/09
TASK 03-50-01-558-806-A01		Nov 01/09
Subtask 03-50-01-558-006-A01		Nov 01/09
Subtask 03-50-01-558-006-B01		Nov 01/09
TASK 03-50-01-558-810-A01		Nov 01/09
Subtask 03-50-01-558-014-A01	R	Oct 01/11
Subtask 03-50-01-558-014-B01	R	Oct 01/11
Subtask 03-50-01-558-010-A01		Nov 01/09
TASK 03-50-01-558-811-A01		Nov 01/09
Subtask 03-50-01-558-021-A01		Nov 01/09
Subtask 03-50-01-558-021-B01		Nov 01/09
Subject 03-60-01		
DESC 03-60-01-001-A01		Nov 01/09
CHAPTER 04		
Subject 04-00-00		
DESC 04-00-00-001-A01		Nov 01/09
Subject 04-20-00		
TASK 04-20-00-588-801-A01		Nov 01/09
Subtask 04-20-00-588-001-A01		Nov 01/09
FIGURE 04-20-00-991-001-A01		Nov 01/09
FIGURE 04-20-00-991-001-B01		Nov 01/09
Subject 04-30-00		

CONTENT	CHG CODE	LAST REVISION DATE
DESC 04-30-00-001-A01		Nov 01/09
FIGURE 04-30-00-991-001-A01		Nov 01/09
FIGURE 04-30-00-991-002-A01		Nov 01/09
FIGURE 04-30-00-991-003-A01		Nov 01/09
TASK 04-30-00-556-801-A01		Nov 01/09
Subtask 04-30-00-869-001-A01		Nov 01/09
Subtask 04-30-00-556-001-A01		Nov 01/09
Subtask 04-30-00-556-002-A01		Nov 01/09
FIGURE 04-30-00-991-004-A01		Nov 01/09
FIGURE 04-30-00-991-005-A01		Nov 01/09
FIGURE 04-30-00-991-006-A01		Nov 01/09
FIGURE 04-30-00-991-007-A01		Nov 01/09
Subject 04-40-00		
DESC 04-40-00-001-A01		Nov 01/09
Subject 04-50-00		
DESC 04-50-00-001-A01		Nov 01/09
Subject 04-80-00		
DESC 04-80-00-001-A01		Apr 01/10
Subject 04-80-11		
TASK 04-80-11-869-801-A01		Nov 01/09
Subtask 04-80-11-869-001-A01		Nov 01/09
Subtask 04-80-11-010-001-A01		Nov 01/09
Subtask 04-80-11-010-002-A01		Nov 01/09
FIGURE 04-80-11-991-005-A01		Nov 01/09
FIGURE 04-80-11-991-006-A01		Nov 01/09
FIGURE 04-80-11-991-007-A01		Nov 01/09
Subject 04-80-13		
TASK 04-80-13-869-801-A01	R	Oct 01/11
Subtask 04-80-13-010-001-A01		Apr 01/10

CONTENT	CHG CODE	LAST REVISION DATE
Subtask 04-80-13-010-002-A01		Apr 01/10
Subtask 04-80-13-010-003-A01		Apr 01/10
Subtask 04-80-13-481-001-A01		Apr 01/10
FIGURE 04-80-13-991-001-A01		Apr 01/10
FIGURE 04-80-13-991-002-A01		Apr 01/10
FIGURE 04-80-13-991-003-A01		Apr 01/10
FIGURE 04-80-13-991-004-A01		Apr 01/10
FIGURE 04-80-13-991-005-A01		Apr 01/10
FIGURE 04-80-13-991-010-A01		Apr 01/10
FIGURE 04-80-13-991-011-A01		Apr 01/10
Subject 04-80-20		
TASK 04-80-20-867-801-A01		Nov 01/09
Subtask 04-80-20-869-001-A01		Nov 01/09
Subtask 04-80-20-867-002-A01		Nov 01/09
Subtask 04-80-20-867-004-A01		Nov 01/09
FIGURE 04-80-20-991-001-A01		Nov 01/09
FIGURE 04-80-20-991-002-A01		Nov 01/09
FIGURE 04-80-20-991-007-A01		Nov 01/09
FIGURE 04-80-20-991-008-A01		Nov 01/09
FIGURE 04-80-20-991-010-A01		Nov 01/09
FIGURE 04-80-20-991-006-A01		Nov 01/09
CHAPTER 05		
Subject 05-00-00		
DESC 05-00-00-001-A01		Apr 01/10
Subject 05-10-00		
DESC 05-10-00-001-A01		Nov 01/09
FIGURE 05-10-00-991-004-A01		Nov 01/09
Subject 05-20-00		
DESC 05-20-00-001-A01		Nov 01/09

CONTENT	CHG CODE	LAST REVISION DATE
DESC 05-20-00-002-A01		Nov 01/09
FIGURE 05-20-00-991-013-A01		Nov 01/09
FIGURE 05-20-00-991-001-A01		Nov 01/09
FIGURE 05-20-00-991-002-A01		Nov 01/09
DESC 05-20-00-004-A01		Nov 01/09
FIGURE 05-20-00-991-014-A01		Nov 01/09
FIGURE 05-20-00-991-015-A01		Nov 01/09
Subject 05-30-00		
TASK 05-30-00-650-801-A01		Nov 01/09
Subtask 05-30-00-869-001-A01		Nov 01/09
Subtask 05-30-00-650-002-A01		Nov 01/09
Subject 05-40-00		
DESC 05-40-00-001-A01		Nov 01/09
Subject 05-40-01		
TASK 05-40-01-650-801-A01		Nov 01/09
Subtask 05-40-01-869-001-A01		Nov 01/09
Subtask 05-40-01-650-003-A01		Nov 01/09
Subject 05-40-02		
TASK 05-40-02-650-801-A01	R	Oct 01/11
Subtask 05-40-02-869-001-A01		Nov 01/09
Subtask 05-40-02-650-002-A01		Nov 01/09
FIGURE 05-40-02-991-004-A01		Nov 01/09
FIGURE 05-40-02-991-001-A01		Nov 01/09
Subject 05-40-03		
TASK 05-40-03-650-802-A01	R	Oct 01/11
Subtask 05-40-03-869-001-A01		Nov 01/09
Subtask 05-40-03-650-001-A01		Nov 01/09
FIGURE 05-40-03-991-001-A01		Nov 01/09
Subject 05-40-04		

CONTENT	CHG CODE	LAST REVISION DATE
TASK 05-40-04-650-802-A01		Nov 01/09
Subtask 05-40-04-481-001-A01		Nov 01/09
Subtask 05-40-04-650-002-A01		Nov 01/09
Subtask 05-40-04-650-004-A01		Nov 01/09
FIGURE 05-40-04-991-002-A01		Nov 01/09
Subject 05-50-00		
DESC 05-50-00-005-A01		Apr 01/10
Subject 05-60-00		
DESC 05-60-00-001-A01		Nov 01/09
CHAPTER 06		
Subject 06-00-00		
DESC 06-00-00-001-A01		Apr 01/10
DESC 06-00-00-002-A01		Nov 01/09
FIGURE 06-00-00-991-001-A01		Nov 01/09
FIGURE 06-00-00-991-001-C01		Nov 01/09
Subject 06-10-00		
TASK 06-10-00-970-801-A01		Apr 01/10
Subtask 06-10-00-970-001-A01		Apr 01/10
Subtask 06-10-00-869-001-A01		Nov 01/09
FIGURE 06-10-00-991-001-A01		Nov 01/09
FIGURE 06-10-00-991-002-A01		Nov 01/09
TASK 06-10-00-970-802-A01		Apr 01/10
Subtask 06-10-00-970-002-A01		Apr 01/10
TASK 06-10-00-970-803-A01		Nov 01/09
Subtask 06-10-00-970-003-A01		Nov 01/09
Subtask 06-10-00-970-004-A01		Nov 01/09
FIGURE 06-10-00-991-003-A01		Nov 01/09
FIGURE 06-10-00-991-004-A01		Nov 01/09
Subject 06-30-00		

CONTENT	CHG CODE	LAST REVISION DATE
FIGURE 06-50-00-991-015-B01		Oct 01/10
FIGURE 06-50-00-991-016-A01		Nov 01/09
FIGURE 06-50-00-991-016-C01		Nov 01/09
FIGURE 06-50-00-991-022-A01		Apr 01/10
FIGURE 06-50-00-991-019-A01		Apr 01/10
FIGURE 06-50-00-991-019-C01		Apr 01/10
TASK 06-50-00-581-801-A01		Apr 01/10
Subtask 06-50-00-581-001-A01		Apr 01/10
Subject 06-60-00		
DESC 06-60-00-001-A01		Apr 01/10
FIGURE 06-60-00-991-001-A01		Apr 01/10
Subject 06-60-01		
DESC 06-60-01-001-A01		Apr 01/10
FIGURE 06-60-01-991-003-A01		Apr 01/10
FIGURE 06-60-01-991-004-A01		Apr 01/10
FIGURE 06-60-01-991-005-A01		Apr 01/10
Subject 06-60-02		
DESC 06-60-02-001-A01		Apr 01/10
FIGURE 06-60-02-991-012-A01		Apr 01/10
FIGURE 06-60-02-991-013-A01		Apr 01/10
FIGURE 06-60-02-991-014-A01		Apr 01/10
DESC 06-60-02-002-A01		Apr 01/10
FIGURE 06-60-02-991-006-A01		Apr 01/10
FIGURE 06-60-02-991-007-A01		Apr 01/10
FIGURE 06-60-02-991-008-A01		Apr 01/10
Subject 06-60-03		
DESC 06-60-03-002-A01		Oct 01/10
FIGURE 06-60-03-991-017-A01		Apr 01/10
FIGURE 06-60-03-991-018-A01		Apr 01/10

CONTENT	CHG CODE	LAST REVISION DATE
FIGURE 06-60-03-991-019-A01		Apr 01/10
Subject 06-60-04		
DESC 06-60-04-001-A01		Apr 01/10
FIGURE 06-60-04-991-006-A01		Apr 01/10
FIGURE 06-60-04-991-007-A01		Apr 01/10
CHAPTER 07		
Subject 07-00-00		
DESC 07-00-00-002-A01		Nov 01/09
Subject 07-20-00		
DESC 07-20-00-001-A01		Apr 01/10
FIGURE 07-20-00-991-001-A01		Apr 01/10
FIGURE 07-20-00-991-002-A01		Apr 01/10
Subject 07-40-00		
DESC 07-40-00-001-A01		Apr 01/10
Subject 07-40-01		
TASK 07-40-01-584-801-A01		Apr 01/10
Subtask 07-40-01-500-001-A01		Nov 01/09
Subtask 07-40-01-500-002-A01		Oct 01/10
Subtask 07-40-01-869-001-A01		Nov 01/09
Subtask 07-40-01-584-001-A01		Nov 01/09
Subtask 07-40-01-869-002-A01		Nov 01/09
FIGURE 07-40-01-991-001-A01		Nov 01/09
FIGURE 07-40-01-991-002-A01		Nov 01/09
TASK 07-40-01-584-802-A01		Apr 01/10
Subtask 07-40-01-500-003-A01		Nov 01/09
Subtask 07-40-01-500-004-A01		Apr 01/10
Subtask 07-40-01-869-003-A01		Nov 01/09
Subtask 07-40-01-584-002-A01		Nov 01/09
Subtask 07-40-01-869-004-A01		Nov 01/09

CONTENT	CHG CODE	LAST REVISION DATE
Subject 07-40-02		
TASK 07-40-02-584-801-A01		Apr 01/10
Subtask 07-40-02-500-001-A01		Nov 01/09
Subtask 07-40-02-500-002-A01		Apr 01/10
Subtask 07-40-02-869-001-A01		Nov 01/09
Subtask 07-40-02-584-001-A01		Nov 01/09
Subtask 07-40-02-869-002-A01		Nov 01/09
FIGURE 07-40-02-991-001-A01		Nov 01/09
Subject 07-40-03		
TASK 07-40-03-584-801-A01		Nov 01/09
Subtask 07-40-03-584-001-A01		Nov 01/09
Subtask 07-40-03-584-002-A01		Nov 01/09
Subject 07-40-04		
DESC 07-40-04-001-A01	R	Oct 01/11
FIGURE 07-40-04-991-001-A01		Nov 01/09
FIGURE 07-40-04-991-002-A01		Nov 01/09
FIGURE 07-40-04-991-003-A01		Nov 01/09
Subject 07-60-00		
DESC 07-60-00-001-A01		Nov 01/09
Subject 07-60-01		
DESC 07-60-01-001-A01		Nov 01/09
FIGURE 07-60-01-991-001-A01		Nov 01/09
FIGURE 07-60-01-991-002-A01		Nov 01/09
Subject 07-60-02		
DESC 07-60-02-001-A01		Nov 01/09
Subject 07-60-03		
DESC 07-60-03-001-A01		Nov 01/09
CHAPTER 08		
Subject 08-00-00		

CONTENT	CHG CODE	LAST REVISION DATE
DESC 08-00-00-001-A01		Nov 01/09
CHAPTER 09		
Subject 09-00-00		
DESC 09-00-00-001-A01		Nov 01/09
Subject 09-10-01		
DESC 09-10-01-002-A01		Nov 01/09
DESC 09-10-01-001-A01		Nov 01/09
Subject 09-10-02		
DESC 09-10-02-001-A01		Nov 01/09
DESC 09-10-02-003-A01		Nov 01/09
DESC 09-10-02-002-A01		Nov 01/09
FIGURE 09-10-02-991-001-A01		Nov 01/09
Subject 09-10-03		
DESC 09-10-03-001-A01		Nov 01/09
FIGURE 09-10-03-991-001-A01		Nov 01/09
FIGURE 09-10-03-991-001-B01		Nov 01/09
FIGURE 09-10-03-991-002-A01		Nov 01/09
FIGURE 09-10-03-991-002-B01		Nov 01/09
Subject 09-10-04		
DESC 09-10-04-001-A01		Nov 01/09
FIGURE 09-10-04-991-002-A01		Oct 01/10
Subject 09-10-05		
DESC 09-10-05-001-A01		Nov 01/09
FIGURE 09-10-05-991-001-A01		Nov 01/09
Subject 09-10-06		
DESC 09-10-06-001-A01		Nov 01/09
FIGURE 09-10-06-991-001-A01		Nov 01/09
FIGURE 09-10-06-991-001-B01		Nov 01/09
Subject 09-10-08		

CONTENT	CHG CODE	LAST REVISION DATE
FIGURE 09-10-11-991-006-A01		Nov 01/09
FIGURE 09-10-11-991-007-A01		Nov 01/09
Subject 09-10-12		
DESC 09-10-12-001-A01		Nov 01/09
FIGURE 09-10-12-991-001-A01		Nov 01/09
DESC 09-10-12-002-A01		Nov 01/09
FIGURE 09-10-12-991-002-A01		Nov 01/09
FIGURE 09-10-12-991-003-A01		Nov 01/09
FIGURE 09-10-12-991-014-A01		Nov 01/09
DESC 09-10-12-003-A01		Nov 01/09
FIGURE 09-10-12-991-004-A01		Nov 01/09
DESC 09-10-12-004-A01		Oct 01/10
FIGURE 09-10-12-991-008-A01		Nov 01/09
FIGURE 09-10-12-991-009-A01		Nov 01/09
FIGURE 09-10-12-991-015-A01		Nov 01/09
DESC 09-10-12-005-A01		Nov 01/09
FIGURE 09-10-12-991-010-A01		Nov 01/09
DESC 09-10-12-006-A01		Nov 01/09
FIGURE 09-10-12-991-013-A01		Nov 01/09
Subject 09-10-13		
DESC 09-10-13-001-A01		Nov 01/09
FIGURE 09-10-13-991-001-A01		Nov 01/09
Subject 09-10-14		
DESC 09-10-14-001-A01		Nov 01/09
DESC 09-10-14-002-A01		Nov 01/09
FIGURE 09-10-14-991-001-A01		Nov 01/09
FIGURE 09-10-14-991-001-B01		Nov 01/09
DESC 09-10-14-003-A01		Nov 01/09
FIGURE 09-10-14-991-003-A01		Nov 01/09

CONTENT	CHG CODE	LAST REVISION DATE
FIGURE 09-20-01-991-010-A01	R	Oct 01/11
FIGURE 09-20-01-991-011-A01	R	Oct 01/11
FIGURE 09-20-01-991-012-A01	R	Oct 01/11
FIGURE 09-20-01-991-013-A01	R	Oct 01/11
FIGURE 09-20-01-991-014-A01	R	Oct 01/11
FIGURE 09-20-01-991-015-A01	R	Oct 01/11
DESC 09-20-01-004-A01		Nov 01/09
DESC 09-20-01-005-A01		Nov 01/09
FIGURE 09-20-01-991-020-A01		Nov 01/09
TASK 09-20-01-869-801-A01		Nov 01/09
Subtask 09-20-01-869-001-A01		Nov 01/09
Subtask 09-20-01-869-002-A01		Nov 01/09
Subject 09-20-02		
DESC 09-20-02-001-A01		Nov 01/09
Subject 09-30-01		
DESC 09-30-01-002-A01		Nov 01/09
Subject 09-30-02		
DESC 09-30-02-001-A01	R	Oct 01/11
Subject 09-30-03		
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DESC 09-30-03-002-A01		Nov 01/09
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CONTENT	CHG CODE	LAST REVISION DATE
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FIGURE 09-50-01-991-007-A01		Nov 01/09
FIGURE 09-50-01-991-008-A01		Nov 01/09
FIGURE 09-50-01-991-009-A01		Nov 01/09
FIGURE 09-50-01-991-010-A01		Nov 01/09
FIGURE 09-50-01-991-011-A01		Nov 01/09
FIGURE 09-50-01-991-012-A01		Nov 01/09
FIGURE 09-50-01-991-013-A01		Nov 01/09
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INTRODUCTION

01-00 INTRODUCTION

01-00-00 INTRODUCTION

****ON A/C A330-200 A330-300**

DESC 01-00-00-001-A01

General

1. This document is intended to provide, for areas which are under Airbus responsibility, aircraft comprehensive details relative to the procedures, planning, equipment and tooling to effectively recover the A330-200 or A330-300 aircraft. The airlines and airport authorities can use this information as a planning tool for aircraft recovery preparations.

2. Aircraft recovery is an operation that is the result of an unplanned incident and as such, advance preparations should be made. These preparations should include the establishment of an Aircraft Recovery Team, aircraft recovery training, listings of aircraft recovery equipment availability and the development of an internal Aircraft Recovery Process Document.
   These are general procedures and will vary according to the individual incident and the equipment available. In most cases the recovery will be carried out under abnormal conditions of both weather and aircraft attitude.
   Country and state rules and regulations have to be followed, even though they may impede the recovery operation. Make sure that the relevant authorities have formally released the aircraft, before starting the aircraft recovery process. For further information on aircraft accident and incident investigation see ICAO Annex 13.
   Personal safety and prevention of secondary damage are emphasized in this document.
   The data provided in this document is based on a serviceable aircraft in a normal attitude (except where specified). If the aircraft is in a different condition, the data will have to be adjusted accordingly.
   Procedures for aircraft recovery from water are not covered by this document.
   It is recommended that the individual airlines share their aircraft recovery experiences with the aircraft manufacturer and groups such as the International Airline Transport Association (IATA), Aircraft Recovery Task Force (ARTF) and the International Airline Technical Pool (IATP). The International Airline Technical Pool as well as some airports and airlines could provide Aircraft Recovery Kits, at strategic locations around the world. Information about these groups is available at the following web sites:
   - http://www.iata.org
   - http://www.iatp.com

   NOTE : IATP website and recovery kits are available for IATP members only.

   NOTE : This chapter gives references to web sites for information only. Airbus shall not be held liable for web site or document content and for update or change of addresses.

****ON A/C A330-200 A330-300**

DESC 01-00-00-002-A01

Important Notice to Users of this Document

1. General
The technical data contained in this Aircraft Recovery Manual (ARM) is intended only for general planning, preparations and establishing procedures for the recovery of a disabled A330-200 or A330-300 aircraft with consideration given for return to service.
Airbus recommends that A330-200 or A330-300 operators and airport authorities use the data in this manual to develop recovery schemes based on various scenarios, using the equipment available, typical situations and the recommendations included in the ATA specification.
Airbus strongly recommends that all data and actions related to the recovery are recorded to ensure that all necessary corrective actions are taken prior to release to service of the aircraft.
The data given in this document is accurate at the date of publication. In case of any conflict, the Aircraft Technical Specification shall take precedence.
This manual does not include data with regards to any optional modifications. These additions may have an impact on the weight and CG position calculations, defueling and cargo loading procedures. Contact Airbus for further information.

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AIRBUS SHALL HAVE NO OBLIGATION OR LIABILITY WITH RESPECT TO THE BEHAVIOR OF TOOLING USED FOR THE RECOVERY OF THE AIRCRAFT.

01-00-02 SEQUENCE OF THE DOCUMENT

**ON A/C A330-200 A330-300

DESC 01-00-02-001-A01

General

1. This manual obeys the ATA iSpec 2200 specification format.
2. This document uses a three-part identification reference (XX-XX-XX), in which each pair of digit means: CHAPTER, SECTION and SUBJECT.
3. The ARM contains two categories of data.
   A. Description
      This part gives the general description of the aircraft or systems, data related to aircraft recovery (recovery team, recovery charts, landing gear, fuel ...) and worksheets.
      For details about the numbering of the description topics, see FIGURE 01-00-02-991-001-A.
   B. Task
      For details on the task oriented ARM, see DESC 01-00-02-002-A01.
      For details about the numbering of the tasks, see FIGURE 01-00-02-991-002-A.
4. Warnings, Cautions and Notes.
   - WARNING: Calls attention to use of materials, processes, methods, procedures or limits that must be carefully obeyed to prevent injury or death.
   - CAUTION: Calls attention to methods and procedures that must be obeyed to prevent damage to equipment.
   - NOTE: Calls attention to methods that make the work easier or gives explanations.
5. Abbreviations
   All the abbreviations used in this manual are detailed in 09-10-02.
6. Revision bars.
   The revision bars show that the content is either new or revised.
7. This manual recommends that the recovery team makes and issues records to help aircraft return to service and carefully monitors the implementation of corrective actions.
   See 08-00-00.

**ON A/C A330-200 A330-300

F_AR_010002_1_0010101_01_00

```
1    2    3     4     5
XX - XX - XX - XXX - XXX
```

PART	FUNCTION
1 THRU 3	ATA SIX–DIGIT NUMBER FROM THE ATA ISPEC 2200 BREAKDOWN DOCUMENT THAT IDENTIFIES THE CHAPTER–SECTION–SUBJECT.
4	THREE–DIGIT NUMBER THAT IDENTIFIES THE DESCRIPTIONS.
5	THREE–DIGIT ALPHANUMERICAL IDENTIFIER THAT IDENTIFIES THE CONFIGURATION.

Numbering System
Description
FIGURE-01-00-02-991-001-A01

****ON A/C A330-200 A330-300**

1	2	3	4	5	6
XX–	XX–	XX–	XXX–	XXX–	XXX

PART	FUNCTION
1 THRU 3	ATA SIX–DIGIT NUMBER FROM THE ATA ISPEC 2200 BREAKDOWN DOCUMENT THAT IDENTIFIES THE CHAPTER–SECTION–SUBJECT.
4	THREE–DIGIT FUNCTION CODE THAT YOU CAN FIND IN THE FUNCTION CODE LIST (SEE 01–00–02–002) THAT INDICATES THE SPECIFIC PROCEDURE RELATED TO TASKS AND SUBTASKS.
5	THREE–DIGIT NUMBER ALLOCATED TO EACH TASK AND SUBTASK. TO SEPARATE THE TASKS AND SUBTASKS, THE TASK NUMBERS BEGIN AT 801 AND INCREASE, IN SEQUENCE, TO 999 (MAXIMUM). THE SUBTASK NUMBERS BEGIN AT 001 AND INCREASE IN SEQUENCE TO 800 (MAXIMUM) WITHIN THE PROCEDURE.
6	THREE–DIGIT ALPHANUMERICAL IDENTIFIER THAT IDENTIFIES THE CONFIGURATION.

F_AR_010002_1_0020101_01_00

Numbering System
Task
FIGURE-01-00-02-991-002-A01

**ON A/C A330-200 A330-300

DESC 01-00-02-002-A01

Task Oriented ARM

1. General
   In the ARM, the procedures are contained in tasks.
   The task is a logical sequence of the procedure steps and is broken down into subtasks.
   The subtask gives all the details of the significant steps of the procedure.
   For task numbering, see DESC 01-00-02-001-A01.

2. Function Codes

Function Code	Definition	Task/Subtask
000	Removal	Task
010	Remove/Open For Access	Task/Subtask
020	Remove Unit/Component/Disconnect/Loosen/Remove Item	Task/Subtask
040	Deactivation	Task/Subtask
081	Remove Safety Locks	Task/Subtask
200	Inspection/Check	Task
284	Inspection of damage	Subtask
285	Survey Damage and Terrain	Task/Subtask
481	Install Safety Locks	Task/Subtask
500	Material and Aircraft Handling	Task/Subtask
556	Mooring	Task/Subtask
558	Weight and CG Management	Task/Subtask
581	Leveling/Lifting	Task/Subtask
582	Moving the Aircraft	Task/Subtask
583	Shoring	Task/Subtask
584	Towing	Task/Subtask
585	Taxiing	Task/Subtask
586	Lowering	Task/Subtask
587	Debogging	Task/Subtask
588	Stabilizing	Task/Subtask
650	Fueling/Defueling	Task/Subtask
680	Drain Fluid	Task/Subtask
862	De-energize Electrical Network	Task/Subtask
866	Flight Control Surfaces Movement	Task/Subtask

Function Code	Definition	Task/Subtask
867	Landing Gear Movement	Task/Subtask
869	Miscellaneous	Task/Subtask
970	Data Recording/Calculating	Task/Subtask
972	Damage Recording	Subtask
980	Manual Operation or Positioning	Subtask

Task/Subtask Function Codes Definition

TABLE 1

3. Task Structure
Each recovery task is broken down into the paragraphs that follow:

A. Task Supporting Data

(1) General
This paragraph gives general information and a short description of the procedure.

(2) Inspection
This paragraph gives instructions to do a preliminary inspection if necessary.

(3) Job Set Up Data
This paragraph collects all the generic data which are not in the Job Set Up Information and are necessary to do the actions described in the procedure.

(4) Job Set Up Information
This paragraph collects all materials, tools and referenced information necessary to do the actions described in the procedure.

B. Procedure
This paragraph is broken down into subtasks.

(1) Subtasks
The Subtasks contain actions/instructions to do the procedure.

C. Figures
This part contains all illustrations related to the procedure.

**ON A/C A330-200 A330-300

DESC 01-00-02-003-A01

Content

1. MANUAL FRONT MATTER
   This part of the manual contains the preliminary pages.
   Items in this part are:
   A. The manual front page.
   B. The highlights which give the description of changes at subtask and figure level.
   C. The list of effective content which gives for each task, subtask and figure the last revision date with a change code (which is also used in the highlights):
      - blank: no changes
      - R: revised content
      - N: new content
      - D: deleted content.
   D. The table of contents which is the list of chapters, subjects, tasks and descriptions contained in the manual.
2. Chapter 01 - INTRODUCTION
   This chapter gives general data and information on the aircraft.
   Items in this chapter are:
   A. A list of related documents in which it is possible to find more information.
   B. A general aircraft description.
3. Chapter 02 - SURVEY
   This chapter gives the information that follow for areas which are under Airbus responsibility:
   A. An aircraft recovery logic chart, which has been developed for the Aircraft Recovery Manager and his team, to help obey the necessary steps of the recovery process. It is used with a specific CHAPTER/SECTION/SUBJECT of the ARM.
   B. Details on initial inspection, site survey, soil stability, weather conditions and equipment.
   C. Health and safety issues related to aircraft recovery.
4. Chapter 03 - WEIGHT AND CG MANAGEMENT
   This chapter contains the items that follow:
   A. Weight, H-arm, Y-arm and Z-arm management, with general and specific information for operations such as calculation of the NRW, associated H-arm, Y-arm and Z-arm locations and CG.
   B. The names of documents where it is possible to find aircraft weight and balance data.
   C. The effect of different elements on the CG, such as large aircraft components, fuel, payload...

5. Chapter 04 - PREPARATION
   This chapter contains the details that follow:
   A. The tasks which are necessary before leveling/lifting the aircraft (manual operation of flight control surfaces, tethering, ground anchoring, check of weight, H-arm and Y-arm, etc.).
   B. The tethering procedure.
   C. General information and instructions for the manual operation of different units or equipments such as landing gears, flaps, flight controls, cargo doors...
6. Chapter 05 - WEIGHT REDUCTION
   This chapter gives:
   A. Detailed information on the aircraft fuel system.
   B. The way to manually find the fuel quantity.
   C. Various defueling scenarios.
   D. Detailed information on payload removal.
   E. The removal procedure of the major components.
7. Chapter 06 - LEVELING AND LIFTING
   This chapter gives details on:
   A. The basic means of leveling/lifting the aircraft.
      (1) Jacks,
      (2) Pneumatic Lifting Bags,
      (3) Cranes.
   B. The method to calculate expected load, travel range and arc movement based on aircraft attitude, NRW and CG calculated in Chapter 03.
   C. Detailed leveling/lifting scenarios.
8. Chapter 07 - MOVING THE AIRCRAFT
   This chapter gives:
   A. Debogging or towing methods and aircraft limits.
   B. Procedures to be implemented to return a damaged aircraft to the hard surface.
9. Chapter 08 - POST RECOVERY CORRECTIVE ACTIONS
   This chapter gives:
   A. A link to the post recovery AMM inspection.
   B. An explanation about the need of recording and monitoring corrective actions during the recovery operation.
10. Chapter 09 - APPENDIX
    The appendices give general information on:
    A. Units and Measurements.

B. Glossary of terms and list of abbreviations.

C. General aircraft description.

D. Recovery preparation.

E. Tooling and equipment.

F. Calculation worksheets.

**ON A/C A330-200 A330-300

DESC 01-00-02-004-A01

Effectivity Management

1. The Aircraft Recovery Manual is issued to give the data for A330-200 or A330-300 aircraft which are necessary to accomplish a recovery.
   The configuration is managed at the aircraft level:
   - A330-200
   - A330-300

01-00-03 DEFINITIONS

****ON A/C A330-200 A330-300**

DESC 01-00-03-001-A01

General

1. Terms Definitions
   Chapter DESC 09-10-02-001-A01 gives the definition of terms related to aircraft recovery.
2. Abbreviations Definitions
   Chapter DESC 09-10-02-003-A01 gives the definitions of abbreviations related to aircraft recovery.

01-10 RELATED DATA

01-10-01 RELATED DATA

**ON A/C A330-200 A330-300

DESC 01-10-01-002-A01

Airbus Data

1. General

   If necessary, you can find additional information/data in the documents that follow:
   - A330 Aircraft Characteristics (AC)
   - A330 Aircraft Maintenance Manual (AMM)
   - A330 Illustrated Parts Catalog (IPC)
   - A330 Structural Repair Manual (SRM)
   - A330 Maintenance Facility Planning (MFP)
   - A330/A340 Weight and Balance Manual (WBM)
   - A330/A340 Illustrated Tool and Equipment Manual (TEM)
   - A330/A340 Cargo Loading System Manual (CLS)
   - List of Radioactive and Hazardous Elements Manual (LRE)
   - GE CF6-80 Engine Manual
   - PW 4000 Engine Manual
   - RR Trent 700 Engine Manual
   - Airn@v, AirbusWorld, ...

****ON A/C A330-200 A330-300**

DESC 01-10-01-001-A01

Other Data

1. Web Sites
   This topic gives references to web sites for information only. This list is not exhaustive and is made from the data available to Airbus at issue of the ARM.
   - http://www.iata.org
   - http://www.iatp.com

   NOTE : IATP website and recovery kits are available for IATP members only.

   NOTE : This chapter gives references to web sites for information only. Airbus shall not be held liable for web site or document content and for update or change of addresses.

2. Publications - Manuals - Documents
   This topic gives references to non-Airbus manuals or documents for information only. This list is not exhaustive and is made from the data available to Airbus at issue of the ARM. Airbus shall not be held liable for document content.
   - Country Regulation
   - ICAO Annex 14
   - ICAO Annex 13
   - ICAO 9137 Part 5
   - FAA AC 150/5200-31A
   - FAR 139.325 Airport Emergency Plan
   - JAR/FAR 145

3. Airline Documents
   This topic gives references to airline documents for information only. This list is not exhaustive.
   - Airline Aircraft Recovery Process Documents (see DESC 09-20-01-004-A01)
   - Airline Load and Trim Sheet Document
   - Airline Weight and Balance Manual
   - Airline Aircraft Modification Record

01-20 GENERAL AIRCRAFT CHARACTERISTICS

01-20-01 GENERAL AIRCRAFT CHARACTERISTICS

**ON A/C A330-200 A330-300

DESC 01-20-01-001-A01

General Aircraft Description

1. The A330-200 and A330-300 aircraft are subsonic long-range aircraft. These aircraft are suitable for passengers and cargo commercial transport.
   The A330-200 and A330-300 aircraft have 2 turbofan engines under the wings:
   - GE CF6-80 engine,
   - PW 4000 engine,
   - RR Trent 700 engine.

**ON A/C A330-200

2. The A330-200 aircraft has:
   - 7 slats on each wing,
   - 2 flaps (inboard and outboard) on each wing,
   - 2 ailerons (inboard and outboard) on each wing,
   - 6 spoilers on each wing,
   - 1 trimmable horizontal stabilizer (THS) with 2 elevators,
   - 1 vertical stabilizer with a rudder,
   - A standard configuration with 4 main fuel tanks (1 inner fuel tank and 1 outer fuel tank on each wing) and 1 trim fuel tank. 1 center fuel tank can be installed between the wings, related to the airline configuration.
   - 1 standard 2.5 in refuel/defuel couplings under each wing,
   - 1 nose landing gear with two wheels,
   - 2 main landing gears with a four-wheel bogie,
   - A standard configuration with 2 potable water tanks (1 forward potable-water tank and 1 aft potable-water tank). 1 forward potable-water tank can be installed, related to the airline configuration. The potable water tanks are in the pressurized section of the fuselage.
   - 2 waste water tanks with a capacity related to the cabin layout,
   - 1 lower deck forward cargo compartment,
   - 1 lower deck aft cargo compartment,
   - 1 lower deck bulk cargo compartment.

**ON A/C A330-300

3. The A330-300 aircraft has:
   - 7 slats on each wing,
   - 2 flaps (inboard and outboard) on each wing,
   - 2 ailerons (inboard and outboard) on each wing,

- 6 spoilers on each wing,
- 1 trimmable horizontal stabilizer (THS) with 2 elevators,
- 1 vertical stabilizer with a rudder,
- A standard configuration with 4 main fuel tanks (1 inner fuel tank and 1 outer fuel tank on each wing) and 1 trim fuel tank.
- 1 standard 2.5 in refuel/defuel couplings under right wing. 1 standard 2.5 in refuel/defuel couplings can be installed under left wing, related to the airline configuration.
- 1 nose landing gear with two wheels,
- 2 main landing gears with a four-wheel bogie,
- A standard configuration with 2 potable water tanks (1 forward potable-water tank and 1 aft potable-water tank). 1 forward potable-water tank can be installed, related to the airline configuration. The potable water tanks are in the pressurized section of the fuselage.
- 2 waste water tanks with a capacity related to the cabin layout,
- 1 lower deck forward cargo compartment,
- 1 lower deck aft cargo compartment,
- 1 lower deck bulk cargo compartment.

****ON A/C A330-200 A330-300**

4. The appendix gives detailed aircraft description.
   See 09-00-00.

****ON A/C A330-200 A330-300**

DESC 01-20-01-002-A01

General Aircraft Data

****ON A/C A330-200**

1. This section gives general data (weight, fuel capacity, ...) related to the A330-200 aircraft. Refer to the operator's documentation for accurate values related to the specific aircraft.

Weight Variant	WV020	WV021	WV022	WV023	WV024
Maximum Ramp Weight (MRW) Maximum Taxi Weight (MTW)	230 900 kg (509 046 lb)	230 900 kg (509 047 lb)	233 900 kg (515 660 lb)	233 900 kg (515 660 lb)	202 900 kg (447 317 lb)
Maximum Takeoff Weight (MTOW)	230 000 kg (507 063 lb)	230 000 kg (507 063 lb)	233 000 kg (513 676 lb)	233 000 kg (513 676 lb)	202 000 kg (445 333 lb)
Maximum Landing Weight (MLW)	180 000 kg (396 831 lb)	182 000 kg (401 241 lb)	182 000 kg (401 241 lb)	180 000 kg (396 831 lb)	180 000 kg (396 831 lb)
Maximum Zero Fuel Weight (MZFW)	168 000 kg (370 376 lb)	170 000 kg (374 785 lb)	170 000 kg (374 785 lb)	168 000 kg (370 376 lb)	168 000 kg (370 376 lb)

Aircraft Data for A330-200

TABLE 1

Weight Variant	WV025	WV026	WV027	WV050	WV051
Maximum Ramp Weight (MRW) Maximum Taxi Weight (MTW)	220 900 kg (487 000 lb)	192 900 kg (425 271 lb)	220 900 kg (487 000 lb)	230 900 kg (509 047 lb)	192 900 kg (425 271 lb)
Maximum Takeoff Weight (MTOW)	220 000 kg (485 016 lb)	192 000 kg (423 287 lb)	220 000 kg (485 016 lb)	230 000 kg (507 063 lb)	192 000 kg (423 287 lb)
Maximum Landing Weight (MLW)	182 000 kg (401 241 lb)	180 000 kg (396 831 lb)	180 000 kg (396 831 lb)	180 000 kg (396 831 lb)	180 000 kg (396 831 lb)
Maximum Zero Fuel Weight (MZFW)	170 000 kg (374 785 lb)	168 000 kg (370 376 lb)	168 000 kg (370 376 lb)	168 000 kg (370 376 lb)	168 000 kg (370 376 lb)

Aircraft Data for A330-200

TABLE 2

Weight Variant	WV052	WV053	WV054	WV055	WV056
Maximum Ramp Weight (MRW) Maximum Taxi Weight (MTW)	233 900 kg (515 660 lb)	210 900 kg (464 954 lb)	230 900 kg (509 047 lb)	192 900 kg (425 271 lb)	233 900 kg (515 661 lb)
Maximum Takeoff Weight (MTOW)	233 000 kg (513 676 lb)	210 000 kg (462 970 lb)	230 000 kg (507 063 lb)	192 000 kg (423 287 lb)	233 000 kg (513 677 lb)
Maximum Landing Weight (MLW)	182 000 kg (401 241 lb)	180 000 kg (396 831 lb)	182 000 kg (401 241 lb)	182 000 kg (401 241 lb)	180 000 kg (396 832 lb)
Maximum Zero Fuel Weight (MZFW)	170 000 kg (374 785 lb)	168 000 kg (370 376 lb)	170 000 kg (374 785 lb)	170 000 kg (374 785 lb)	168 000 kg (370 376 lb)

Aircraft Data for A330-200

TABLE 3

Weight Variant	WV057	WV058	WV059	WV060
Maximum Ramp Weight (MRW) Maximum Taxi Weight (MTW)	236 900 kg (522 274 lb)	238 900 kg (526 684 lb))	202 900 kg (447 318 lb)	220 900 kg (487 001 lb)
Maximum Takeoff Weight (MTOW)	236 000 kg (520 291 lb)	238 000 kg (524 700 lb)	202 000 kg (445 334 lb)	220 000 kg (485 017 lb)
Maximum Landing Weight (MLW)	182 000 kg (401 241 lb)	182 000 kg (401 241 lb)	182 000 kg (401 241 lb)	182 000 kg (401 241 lb)
Maximum Zero Fuel Weight (MZFW)	170 000 kg (374 785 lb)	168 000 kg (370 376 lb)	170 000 kg (374 785 lb)	170 000 kg (374 785 lb)

Aircraft Data for A330-200

TABLE 4

Weight Variant	WV061	WV062 *
Maximum Ramp Weight (MRW) Maximum Taxi Weight (MTW)	230 900 kg (509 047 lb)	238 900 kg (526 684 lb))
Maximum Takeoff Weight (MTOW)	230 000 kg (507 063 lb)	238 000 kg (524 700 lb)
Maximum Landing Weight (MLW)	182 000 kg (401 241 lb)	182 000 kg (401 241 lb)

Weight Variant	WV061	WV062 *
Maximum Zero Fuel Weight (MZFW)	168 000 kg (370 376 lb)	168 000 kg to 170 000 kg (370 376 lb to 374 785 lb)

Aircraft Data for A330-200

TABLE 5

NOTE : * Dynamic Payload between WV057 and WV058.

The following table provides characteristics of A330-200 Models, these data are common to each Weight Variant:

Aircraft Characteristics	
Usable Fuel Capacity (Density = 0.785 kg/l)	139 090 l (36 744 US gal)
	109 185 kg (240 711 lb)

Aircraft Data for A330-200

TABLE 6

ON A/C A330-300

2. This section gives general data (weight, fuel capacity, ...) related to the A330-300 aircraft. Refer to the operator's documentation for accurate values related to the specific aircraft.

Weight Variant	WV000	WV001	WV002	WV003
Maximum Ramp Weight (MRW) Maximum Taxi Weight (MTW)	212 900 kg (469 363 lb)	184 900 kg (407 634 lb)	212 900 kg (469 363 lb)	215 900 kg (475 977 lb)
Maximum Takeoff Weight (MTOW)	212 000 kg (467 379 lb)	184 000 kg (405 650 lb)	212 000 kg (467 379 lb)	215 000 kg (473 993 lb)
Maximum Landing Weight (MLW)	174 000 kg (383 603 lb)	174 000 kg (383 603 lb)	177 000 kg (390 217 lb)	177 000 kg (390 217 lb)
Maximum Zero Fuel Weight (MZFW)	164 000 kg (361 557 lb)	164 000 kg (361 557 lb)	167 000 kg (368 171 lb)	167 000 kg (368 171 lb)

Aircraft Data for A330-300

TABLE 7

Weight Variant	WV004 **	WV010	WV011
Maximum Ramp Weight (MRW) Maximum Taxi Weight (MTW)	215 900 kg (475 977 lb)	217 900 kg (480 386 lb)	212 900 kg (469 363 lb)
Maximum Takeoff Weight (MTOW)	215 000 kg (473 993 lb)	217 000 kg (478 402 lb)	212 000 kg (467 379 lb)
Maximum Landing Weight (MLW)	182 000 kg (401 240 lb)	179 000 kg (394 627 lb)	177 000 kg (390 217 lb)
Maximum Zero Fuel Weight (MZFW)	167 000 kg to 172 000 kg (368 171 lb to 379 194 lb)	169 000 kg (372 580 lb)	167 000 kg (368 171 lb)

Aircraft Data for A330-300

TABLE 8

NOTE : ** Linear MTOW / MZFW trade-off relationship.

Weight Variant	WV012	WV013	WV014	WV020	WV022
Maximum Ramp Weight (MRW) Maximum Taxi Weight (MTW)	218 900 kg (482 591 lb)	215 900 kg (475 977 lb)	205 900 kg (453 931 lb)	230 900 kg (509 046 lb)	233 900 kg (515 660 lb)
Maximum Takeoff Weight (MTOW)	218 000 kg (480 607 lb)	215 000 kg (473 993 lb)	205 000 kg (451 947 lb)	230 000 kg (507 062 lb)	233 000 kg (513 676 lb)
Maximum Landing Weight (MLW)	182 000 kg (401 240 lb)	177 000 kg (390 217 lb)	182 000 kg (401 240 lb)	185 000 kg (407 854 lb)	187 000 kg (412 263 lb)
Maximum Zero Fuel Weight (MZFW)	172 000 kg (379 194 lb)	167 000 kg (368 171 lb)	172 000 kg (379 194 lb)	173 000 kg (381 399 lb)	175 000 kg (385 808 lb)

Aircraft Data for A330-300

TABLE 9

Weight Variant	WV024	WV025	WV050	WV051
Maximum Ramp Weight (MRW) Maximum Taxi Weight (MTW)	205 900 kg (453 931 lb)	217 900 kg (480 386 lb)	230 900 kg (509 046 lb)	212 900 kg (469 363 lb)
Maximum Takeoff Weight (MTOW)	205 000 kg (451 947 lb)	217 000 kg (478 000 lb)	230 000 kg (507 062 lb)	212 000 kg (467 379 lb)

Weight Variant	WV024	WV025	WV050	WV051
Maximum Landing Weight (MLW)	185 000 kg (407 854 lb)	179 000 kg (394 627 lb)	185 000 kg (407 854 lb)	187 000 kg (412 263 lb)
Maximum Zero Fuel Weight (MZFW)	173 000 kg (381 399 lb)	169 000 kg (372 580 lb)	173 000 kg (381 399 lb)	175 000 kg (385 808 lb)

Aircraft Data for A330-300

TABLE 10

Weight Variant	WV052	WV053	WV054
Maximum Ramp Weight (MRW) Maximum Taxi Weight (MTW)	233 900 kg (515 660 lb)	205 900 kg (453 931 lb)	235 900 kg (520 070 lb)
Maximum Takeoff Weight (MTOW)	233 000 kg (513 676 lb)	205 000 kg (451 947 lb)	235 000 kg (518 086 lb)
Maximum Landing Weight (MLW)	187 000 kg (412 263 lb)	185 000 kg (407 854 lb)	187 000 kg (412 263 lb)
Maximum Zero Fuel Weight (MZFW)	175 000 kg (385 808 lb)	173 000 kg (381 399 lb)	173 000 kg (381 399 lb)

Aircraft Data for A330-300

TABLE 11

Weight Variant	WV055 ***	WV056
Maximum Ramp Weight (MRW) Maximum Taxi Weight (MTW)	235 900 kg (520 070 lb)	205 900 kg (453 931 lb)
Maximum Takeoff Weight (MTOW)	235 000 kg (518 086 lb)	205 000 kg (451 947 lb)
Maximum Landing Weight (MLW)	187 000 kg (412 263 lb)	187 000 kg (412 263 lb)
Maximum Zero Fuel Weight (MZFW)	173 000 kg to 175 000 kg (381 399 lb to 385 808 lb)	175 000 kg (385 808 lb)

Aircraft Data for A330-300

TABLE 12

NOTE : *** Dynamic Payload between WV052 and WV054.

The following table provides characteristics of A330-300 Models, these data are common to each Weight Variant:

Aircraft Characteristics	
Usable Fuel Capacity (Density = 0.785 kg/l)	97 530 l (25 765 US gal)
	76 561 kg (168 787 lb)

Aircraft Data for A330-300

TABLE 13

SURVEY

02-00 SURVEY

02-00-00 SURVEY

****ON A/C A330-200 A330-300**

DESC 02-00-00-001-A01

General

1. Introduction
   The objective is to define a recovery scenario based on a recovery plan and implement it:
   - Without causing secondary damage,
   - By ensuring traceability of actions performed.

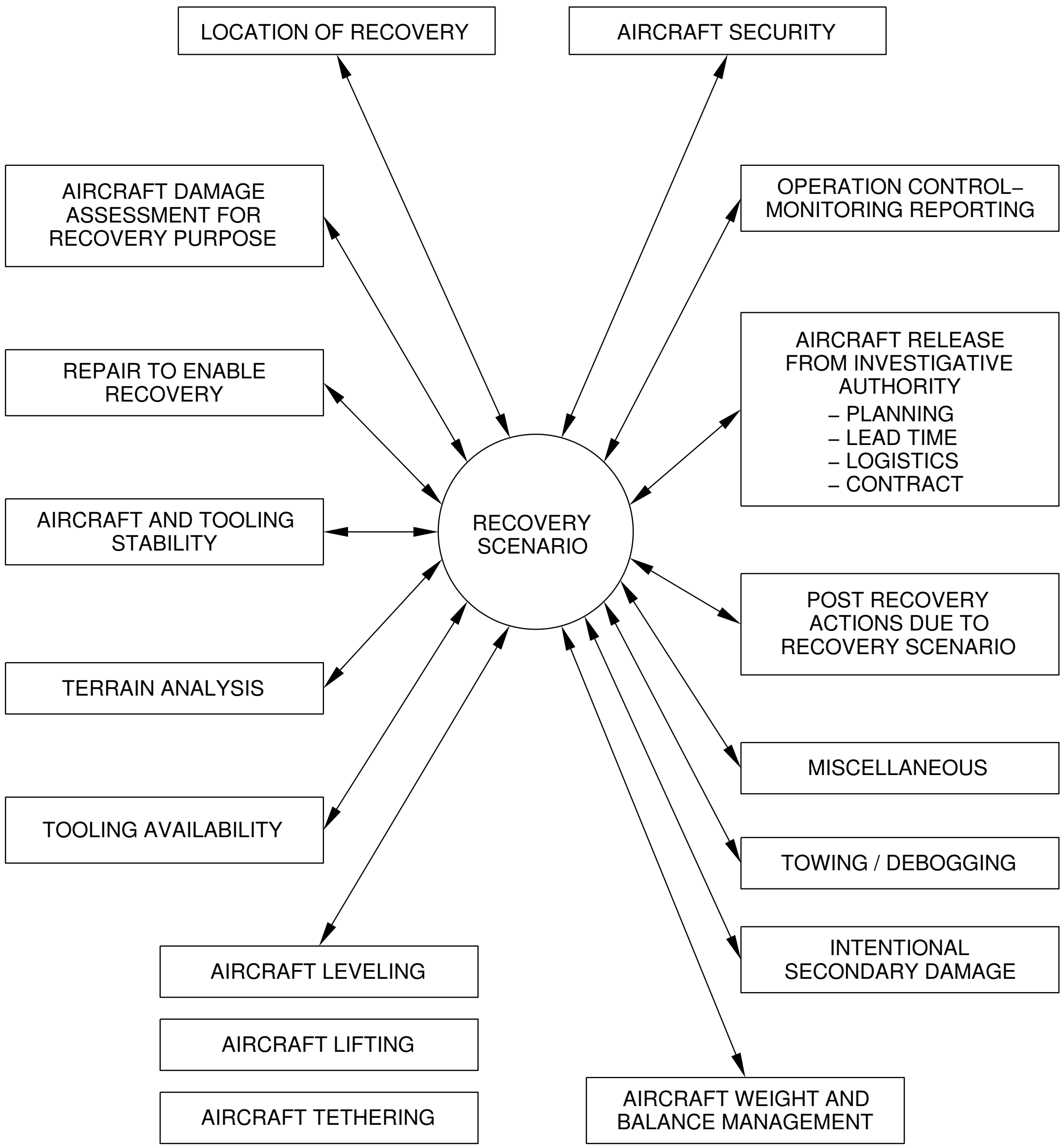
   The recovery must be set up and controlled according to a recovery process.
   If a recovery contributing factor (see FIGURE 02-00-00-991-002-A) changes or is not as expected, each section must be reviewed to reconsider the recovery process.
   The recovery process is detailed in chapter 02-10-01 and is valid when there is no worldwide recovery standard procedure for events of an infinite variety, even if there are basic leveling techniques:
   - Use of Jacks (see 06-30-00),
   - Use of Pneumatic Lifting Bags (see 06-40-00),
   - Use of Cranes (see 06-50-00).

   The ARM planning chart, aircraft recovery logic chart or the IATA aircraft recovery quick reference checklist could be used to support this recovery process (see 09-20-01).

2. Recovery Secondary Damage
   The objective of a successful aircraft recovery operation is to move the aircraft from the incident or accident site to a repair area or facility without causing any secondary damage.
   The secondary damage is a damage which is not due to the initial event, and can increase the repair time. However, due to time or cost constraints, secondary damage will be accepted from involved parties. In that case make sure that the time saving is acceptable in comparison with the cost.
   The insurance underwriters can probably contest any secondary damage. Therefore every step of the recovery process must be continually monitored with appropriate action taken to prevent it.

   NOTE : The damage on airport infrastructure or field can be considered as secondary damage if adequate action is not done in due time.

**ON A/C A330-200 A330-300



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Recovery Process
Contributing Factors
FIGURE-02-00-00-991-002-A01

02-10 CHARTS AND GUIDES

02-10-01 CHARTS AND GUIDES

****ON A/C A330-200 A330-300**

DESC 02-10-01-001-A01

Aircraft Recovery Process

1. General
   The recovery methods used are specific to each recovery operation, are dependent on multiple drivers and constraints, including non aircraft specific drivers, as well as the individual aircraft recovery considerations.
   The recovery process can be divided into five basic sections:
   - Survey,
   - Planning,
   - Preparation,
   - Recovery,
   - Reporting.

   A. Survey

      (1) Before you get access to the incident or accident site and while waiting for release of the aircraft from the Investigative Authorities, some preliminary tasks can be carried out.
      Some general issues are:
      - Get and record the initial incident or accident data,
      - Secure the site: fire, theft and access control,
      - Confirm that members of the Aircraft Recovery Team are available,
      - Arrange delivery of any local aircraft recovery equipment,
      - Make communication with airport and Investigative Authorities,
      - Identify the hazardous materials which are on board,
      - Get an airport plan to assess aircraft or recovery team travel path difficulty, etc.

      (2) After access to the incident or accident site, you must do a detailed inspection and a record of the items that follow:
      - Integrity of the aircraft structure and landing gear,
      - Survey of the soil conditions,
      - Local weather conditions,
      - Personnel health and safety issues,
      - Environmental concerns.

      (3) The other issues to consider if the incident took place at a secondary or international airport are:
      - Transportation of personnel and equipment,
      - Visas, passports and vaccinations certificates,
      - Hotels and local transport.

B. Planning

The main planning issues are (not in order of importance) :

- Identification of your recovery drivers,
- Adverse weather conditions or critical forecast which can have an impact on material required, recovery plan and recovery team operation, etc.
- Limitation of airport use with the disabled aircraft,
- Type of leveling, lifting or removal plan,
- Aircraft weight and balance management operation, if necessary,
- Unserviceable aircraft systems,
- Storage of removed fuel,
- Aircraft movement possibility and path,
- Compilation of all corrective actions, necessary logistics and planning,
- Necessary tooling.

C. Preparation

The main preparation issues are (not necessary in the applicable order) :

- Control weight and CG by removal or transfer of the required amount of fuel and payload,
- Make the aircraft stable,
- Assemble the required equipment for the leveling/lifting method that you will use,
- Remove components which are damaged,
- Remove components to help the weight reduction,
- Test and stabilize the soil if necessary.

D. Recovery

The main recovery issues are (in priority order) :

- Obey the safety conditions for personnel,
- Monitor and record load when you level, lift and move the aircraft,
- Level the aircraft as required,
- Lift the aircraft as required,
- Move the aircraft.

E. Reporting

It is necessary to do the recovery records. The Recovery Manager must hand these records over to the maintenance team. They will be used to do the necessary corrective action and release the aircraft back to service, for systems and structure.

****ON A/C A330-200 A330-300**

DESC 02-10-01-002-A01

Aircraft Recovery Logic Chart

1. General
   The Aircraft Recovery Logic Charts (see DESC 09-20-01-002-A01) are an aid for the Aircraft Recovery Manager and his team. The recovery charts describe the necessary steps of the recovery process and can be used as a checklist by ticking off the boxes when completed. Although detailed, the chart must be used with the complete ARM. These charts give the specific areas of the ARM where you can find additional and more detailed data on a specific subject.

02-20 INITIAL SURVEY

02-20-01 INITIAL AIRCRAFT SURVEY

****ON A/C A330-200 A330-300**

TASK 02-20-01-285-801-A01

Initial Aircraft Survey

1. General
   A detailed aircraft condition report must be completed as soon as possible to help the basic approach to the recovery process, to ensure safety of the personnel and to anticipate the repairs. The inspection and the subsequent report do not need to be as detailed for the recovery as for repair of the aircraft.
   Photographs, sketches, measurements, notes, etc. can complete the documentation. Digital cameras, video recorders and pocket audio recorders can help to record the data.
   The documentation will help engineering staff, insurance surveyors and manufacturer representatives to discuss the details of the recovery scenarios/options. This information will be helpful to fill in a report when the recovery is completed.
   The future airworthiness of the aircraft can be dependent on the accuracy of the data recorded during the recovery operation. These records must include accurate figures on all loads applied to the aircraft during the recovery.
   In most cases, the accident investigation will be more important than the aircraft recovery process. The objective of the accident investigation is to determine the cause of the incident or accident and provide details to prevent the re-occurrence of such an event.
   Keep in mind that the time between the notification of the event and release of the aircraft by the Investigative Authorities can be several hours.
   If the Investigative Authority asks for removal of the Aircraft Flight Data and Cockpit Voice Recorders, qualified personnel must do it and obey AMM procedures. These units are to be handed over to the Investigative Authority. In return, the Investigative Authority will give you a receipt with the aircraft registration and the serial numbers of the removed units.
   It is necessary to note current and forecast weather.

2. Inspections
   It is necessary to estimate the fuel quantity, the cargo on board.
   It is also necessary to identify and quantify hazardous materials with any required personnel protective equipment.

3. Job Setup References
   Not Applicable.

4. Job Set-up Information

A. Referenced Information

REFERENCE	DESIGNATION
AMM	

Referenced Information

TABLE 1

5. Procedure

WARNING : DO NOT CLIMB ON, GO INTO OR GO BELOW THE AIRCRAFT UNTIL THE AIRCRAFT IS STABLE.

WARNING : MAKE SURE THAT THE AIRCRAFT IS CORRECTLY GROUNDED.

NOTE : The information or principle contained in this chapter are given as a guide to assist an aircraft recovery.

Subtask 02-20-01-284-001-A01

A. Inspection of Damage

(1) Without climbing on, going into or going below the aircraft, identify and record all obvious and visible damage. Note the location on the fuselage with frame (station) and stringer numbers, and on the wing with rib and station numbers.

(2) The types of damage include cracked, creased, distorted or torn fuselage and wing skin panels and also missing or broken fasteners (bolts, rivets...) and fittings.

(3) These types of damage are signs of failed structural components and must be considered as suspect. These failed structural components cannot be relied on to carry their designed loads. It is necessary to do a more detailed inspection on these areas prior to leveling, lifting or moving the aircraft.

(4) It is necessary to record any evidence of fire or overheating.

(5) It is also necessary to identify missing and damaged components such as landing gear, flap sections and non-structural fairings. Broken fairings can be a sign of hidden damage to other structural areas.

(6) It is necessary to do a more detailed inspection on these areas prior to leveling, lifting or moving the aircraft.

Subtask 02-20-01-680-001-A01

B. Fluid Leaks

(1) Fluid leaks must be identified.

(2) These fluid leakages can be fuel, hydraulic fluid, lavatory waste water, potable water and any fluid transported in the cargo compartments.
At the first indication of a fluid leak, the airport or Investigative Authorities must call for a hazardous materials response company to contain these leaking fluids.

(3) Cap lines and manually close valves to stop or control fluid leaks. Or temporarily plug holes or openings to stop the flow. If there is a fuel leak, defueling must be a primary task.

NOTE : This step can be required at any point during the initial aircraft survey.

Subtask 02-20-01-862-001-A01

C. Batteries

(1) If there is any structural damage on the fuselage or wings, it is necessary to remove or isolate the aircraft batteries as soon as the aircraft is stable.

NOTE : This step can be required at any point during the initial aircraft survey.

(2) It is possible to keep the batteries connected if there is no structural or system damage. This can be useful later for the recovery process. This decision can be re-examined during the survey and recovery.

NOTE : At this point, it is possible to try to make the aircraft stable and safe so that it is possible to do a detailed inspection in and below the aircraft.

Subtask 02-20-01-869-001-A01

D. Landing Gear

WARNING : MAKE SURE THAT LANDING GEAR DOWNLOCK PINS ARE INSTALLED IF THEIR INSTALLATION IS POSSIBLE.

(1) If a landing gear malfunction caused the event, it can be possible to continue to use the aircraft landing gear to move the aircraft when lifted. It is necessary to make sure that the structure and landing gear (when extended) can support the aircraft weight. Examples are:
- One or more landing gear(s) remained retracted at touchdown,
- One or more landing gear(s) collapsed after touchdown due to downlock failures,
- One or more landing gear(s) folded or collapsed when the aircraft left the runway and bogged down in mud, snow or sand.

(2) In these cases, it can be possible to extend and lock the landing gear down after lifting the aircraft and after carrying out temporary repairs to strengthen or brace damaged parts. If repairs are necessary, it is usually less difficult and less time consuming to do these repairs than to have secondary damage when moving the aircraft on a trailer or a recovery transport vehicle.

(3) Make sure that spare landing-gear assemblies are available to replace damaged or missing ones, if required.

02-20-02 INITIAL SITE SURVEY

****ON A/C A330-200 A330-300**

TASK 02-20-02-285-801-A01

Initial Site Survey

1. General
   This procedure gives details on how to do a full survey of the incident site around the aircraft.

2. Inspections
   Not Applicable.

3. Job Setup References
   Get an airport map from the airport authority (we recommend a topographical map, which includes subterranean infrastructure localization) of the incident area.

4. Job Set-up Information

   A. Referenced Information

REFERENCE	DESIGNATION
AC 07-00-00	

Referenced Information

TABLE 1

5. Procedure

   NOTE : The information or principle contained in this chapter are given as a guide to assist an aircraft recovery.

   Subtask 02-20-02-285-001-A01

   A. Terrain

      (1) If the ground is sufficiently flat, the recovery process can be more direct. It will be more difficult to move the aircraft on a rolling terrain with hills and it can be necessary to grade the ground.
      You can report on the airport site plan the position of the aircraft, the flatness, slopes, hills, width and depth of any ditches or culverts and surrounding vegetation. You can examine the area to know if there is any animal life (rodents and snakes).

Subtask 02-20-02-285-002-A01

B. Soil Characteristics

(1) The load bearing capacity is very important. This information is necessary to set up the support equipment to level, lift or move the aircraft.
It is also necessary to do the selection of the type of tethering. The type of ground anchors is dependent on the soil properties.

(2) The type of soil can be noted in addition to the substrate. It is possible to use the ruts made by the landing gear to identify the subsurface soil type.

(3) Subterranean airport infrastructure must be known.
Signs of recent excavations must be noted. The airport site plan must be amended to indicate any of these areas. Signs of recent excavations usually show soft and unstable ground.
This information is very important, as it will influence the path to move the aircraft during the recovery.

(4) One of the standards used to compare different soil conditions is the California Bearing Ratio or CBR.
This test measures the load necessary to make a plunger of a standard area penetrate a soil sample. The information is recorded on a standard graph and the plot of the test gives the CBR result of the soil test.
The CBR is a procedure to put a figure on the inherent strength of the soil. The soil must have a homogeneous CBR rating through a sufficient depth. For more details, you can refer to a ground engineer.

(5) The possible effect of rainfall on the ground load bearing capabilities can change with the surface hardness, smoothness or drainage.
Use pumps to remove standing water and dig drainage ditches from the work area.

Subtask 02-20-02-500-001-A01

C. Access Routes

(1) Access routes to the incident site can be planned with the airport site map. In most cases, it is necessary to go across active runways.
The air traffic control service must plan and control these routes.

(2) Carefully review of the path of the aircraft from the runway to the resting point.
The distance to runways, taxiways and aprons, the type of soil, rut depth and terrain will all influence in which direction the aircraft will be moved once the actual recovery starts.

(3) Pavement requirements for the particular aircraft are derived from the static analysis of loads imposed on the main landing gear struts.
These main landing gear loads are used as the point of entry to the pavement design charts (See AC 07-00-00).
Make sure that the surfaces you will move the aircraft on are able to support these loads.

(4) Make sure that the specific ground tooling or road used to level, lift or move the aircraft are able to support aircraft load.

(5) Make sure that the loads applied to the aircraft are not more than aircraft allowable loads.

Subtask 02-20-02-869-001-A01

D. Weather

(1) Weather conditions can play a major role during aircraft recovery operations. General meteorological conditions (temperature, wind speed and precipitation) must be recorded.

(2) Temperature, both extreme heat and extreme cold, will determine the type of clothing, meals and liquid intake for the manpower involved in the recovery. The need for shelter from heat or cold will also have to be determined.

(3) Forecast conditions must be acquired and recorded. The forecast will help to prepare the type of personal protective clothing and to determine the recovery plan.

(4) Make sure that the required tooling can be used within forecast conditions.

(5) Wind and projected wind gust speeds will determine the amount of tethering and will influence any attempts at lifting the aircraft.

(6) Any type of precipitation will have consequences in the grading, soil support and general recovery operation.

02-30 LANDING GEAR

02-30-01 LANDING GEAR

****ON A/C A330-200 A330-300**

TASK 02-30-01-200-801-A01

Landing Gear Survey

1. General

WARNING : LET THE BRAKES AND THE WHEELS BECOME COOL BEFORE YOU GO NEAR THE LANDING GEAR. DO NOT APPLY A LIQUID OR GAS FIRE EXTINGUISHER DIRECTLY ON A HOT WHEEL OR BRAKE UNIT. IF YOU DO NOT OBEY THESE PRECAUTIONS, THERE IS A RISK OF EXPLOSION.

WARNING : MAKE SURE THAT THE LANDING GEAR IS UPLOCKED BEFORE YOU OPEN THE GEAR DOORS MANUALLY. IF THE GEAR IS NOT UPLOCKED, THE WEIGHT OF THE GEAR CAN BE ON THE DOORS. IF YOU OPEN THE DOORS IN THIS CONDITION, THERE IS A RISK THAT THE LANDING GEAR WILL EXTEND BY GRAVITY AND CAUSE INJURY.

The principles outlined in this chapter are provided as a guide to assist aircraft recovery.
The chapter gives the general inspections required to find the extent of any damage to the landing gear and the recommended steps required to recover the aircraft.
You must do the applicable inspections before moving the aircraft.
For the description of the landing gears, see 09-10-16.

2. Inspections
Not Applicable.

3. Job Setup References
Not Applicable.

4. Job Set-up Information

A. Referenced Information

REFERENCE	DESIGNATION
TASK 02-30-01-481-802-A02	TASK 02-30-01-481-802-A02-Installation of the Safety Devices on Landing Gears
09-10-16	09-10-16-LANDING GEARS
04-20-00	04-20-00-STABILIZING THE AIRCRAFT
07-60-00	07-60-00-MOVING DAMAGED AIRCRAFT
07-40-03	07-40-03-TOWING WITH DEFLATED TIRES
07-40-00	07-40-00-TOWING AND DEBOGGING
06-00-00	06-00-00-LEVELING AND LIFTING
04-80-00	04-80-00-MANUAL OPERATION OF SYSTEMS

REFERENCE	DESIGNATION
AMM 29-00-00-864	
AMM 24-41-00-862-801	
AMM 32-51-00-040	
AMM 32-42-00PB401	
FIGURE 02-30-01-991-001-A	FIGURE 02-30-01-991-001-A-Landing Gear
FIGURE 02-30-01-991-002-A	FIGURE 02-30-01-991-002-A-Landing Gear
FIGURE 02-30-01-991-001-A	FIGURE 02-30-01-991-001-A-Landing Gear

Referenced Information

TABLE 1

5. Procedure

Subtask 02-30-01-867-001-A01

A. Safety Precautions

(1) Make sure that the aircraft is stable, see 04-20-00.

(2) Make sure that the Ground Lock Pins are installed on the landing gear where possible, see TASK 02-30-01-481-802-A02.

(3) Make sure that the MLG and NLG wheels are chocked where possible.

(4) Make sure that the Landing-Gear Control Lever (6GA) is in the DOWN position and put a warning notice to tell people not to operate the landing gear lever.

(5) On the center pedestal, make sure that the Landing-Gear GRVTY Switches are in the OFF position and safe, see FIGURE 02-30-01-991-001-A.

(6) If the aircraft wheel brake hydraulic circuits are serviceable:

(a) On the center pedestal, see FIGURE 02-30-01-991-002-A, set the PARK BRK switch to the ON position.

(b) On the center panel, see FIGURE 02-30-01-991-002-A, make sure that the pressure indication on the triple-indicator is correct. The pointer of the top gage (ACCU PRESS) must be in the green range.

(c) Make sure that the hydraulic systems are depressurized, see AMM 29-00-00-864.

(d) Make sure that the aircraft electrical circuits are de-energized, see AMM 24-41-00-862-801.

(7) Put safety barriers around the Landing Gear(s) that are not correctly extended and downlocked.

Subtask 02-30-01-867-003-A01

B. Landing Gear Positions

(1) A Landing Gear can be found in the following conditions:

(a) Fully extended and downlocked.

(b) Not fully extended or retracted.

(c) Retracted and uplocks released (Landing Gear Doors closed).

(d) Retracted and uplocked.

(e) Collapsed or missing.

(f) Bogged.

WARNING : IF THE LANDING GEAR DOES NOT FULLY EXTEND WHEN THE AIRCRAFT IS LEVEL, SAFETY THE LANDING GEAR TO PREVENT UNWANTED MOVEMENT.

(2) Before doing the inspection, make sure you know the position of the Landing Gear.

(a) Landing Gear fully extended and downlocked, see TASK 02-30-01-481-802-A02:

1 Do the applicable inspection for that Landing Gear (NLG or MLG).

(b) Landing Gear not fully extended or retracted:

1 See 06-00-00 for the procedure to level and lift the aircraft.

2 It will be necessary to secure the Landing Gear to prevent it travelling further and becoming a danger to anyone or to the recovery operations.

3 To support the gear, put a hydraulic lifting platform under the Landing Gear to be supported. The platform must be able to support the weight of the landing gear. Make sure that the lifting surface is covered with support materials, such as tires or foam, to protect the Landing Gear from damage.

4 To further support the gear, raise the platform until the support materials make good contact with the Landing Gear to prevent accidental movement of the gear during the inspection.

5 You must make sure that all other ground lock pins are installed, then in the cockpit, set the Landing-Gear GRVTY Switches to DOWN. This will open the hydraulic system to RETURN and allow the unlocked leg to be lifted. See FIGURE 02-30-01-991-001-A.

6 Do the applicable inspection for that Landing Gear (NLG or MLG).

(c) Landing Gear Retracted and uplocked:

1 If the NLG is retracted and uplocked, it must be lowered and downlocked before an inspection can be done, see 04-80-00 for the manual extension procedure.

2 If the MLG is retracted and uplocked, it must be lowered and downlocked before an inspection can be done, see 04-80-00 for the manual extension procedure.

(d) Landing Gear Retracted and uplocks released (Landing Gear Doors closed):

1 If the NLG is retracted with the Landing Gear Doors closed, see 04-80-00 for the procedure to manually extend the gear, then do the applicable inspection.

2 If the MLG is retracted with the Landing Gear Doors closed, see 04-80-00 for the procedure to manually extend the gear, then do the applicable inspection.

(e) Landing Gear Collapsed or missing:
If a Landing Gear is collapsed, missing or unusable, see 07-60-00 for the procedure to move a damaged aircraft using special recovery vehicles.

(f) Landing Gear locked down and bogged down:

1 Do the applicable inspection for that Landing Gear (NLG or MLG).

2 See TBD for the debogging procedure.

Subtask 02-30-01-867-004-A01

C. Landing Gear Inspection

(1) Main Landing Gear

(a) Do a visual inspection of the Main Landing Gear, the attachments to the Airframe, the doors. Look for signs of distortions, cracks and ruptures. If this type of damage is found on a component, it must be replaced before you move the aircraft.

(b) The following components can be removed if they are not usable or if they will impede the recovery operation:

- The wheel brake components, see AMM 32-42-00PB401 for information on the deactivation of brake components before you remove them.
- The Main Door.
- The Hinged Door.
- The Fairing Door.

(c) If the repair or replacement of damaged components is not possible because of general area damage, the aircraft must be recovered on specialised recovery vehicles, see 07-60-00.

(d) Do a visual inspection of the tires. If there are deflated tires, see 07-40-03 for the applicable limitations.

(2) Nose Landing Gear

(a) Do a visual inspection of the Nose Landing Gear, the attachments to the Airframe, the two Forward and the two Rear Doors. Look for signs of distortions, and ruptures. If this type of damage is found on a component, it must be replaced before you move the aircraft.

(b) The following components can be removed if they are not usable or if they will impede the recovery operation:
  - The Forward Doors.
  - The Rear Doors.
  - The Nosewheel Steering components.

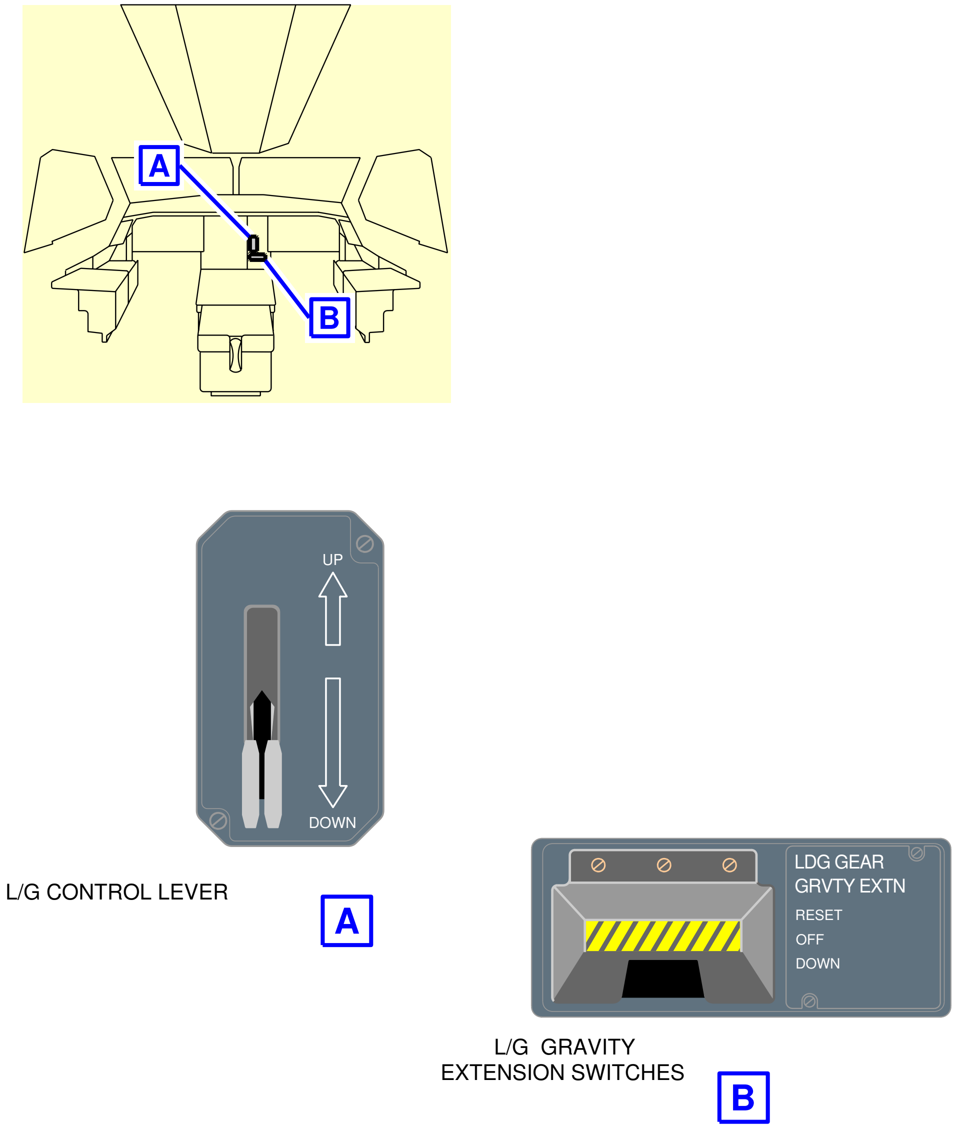
(c) See AMM 32-51-00-040 for the procedure to deactivate the NWS.

(d) If the repair or replacement of damaged components is not possible because of general area damage, the aircraft must be recovered on specialised recovery vehicles, see 07-60-00.

(e) If the NLG is bogged, see TBD. If the NLG is on a hard surface see 07-40-00.

(f) Do a visual inspection of the tires. If there are deflated tires, see 07-40-03 for the applicable limitations.

**ON A/C A330-200 A330-300



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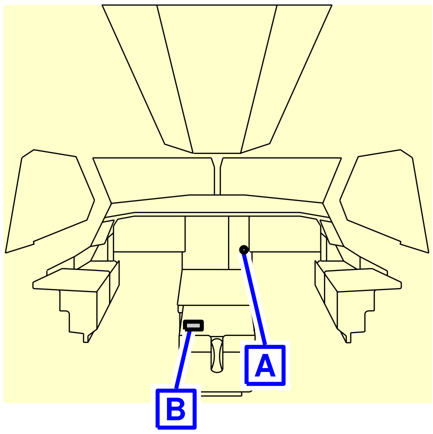
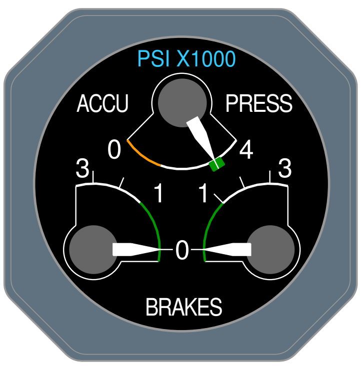
Landing Gear
L/G Control Lever and L/G GRVTY Switches
FIGURE-02-30-01-991-001-A01

**ON A/C A330-200 A330-300





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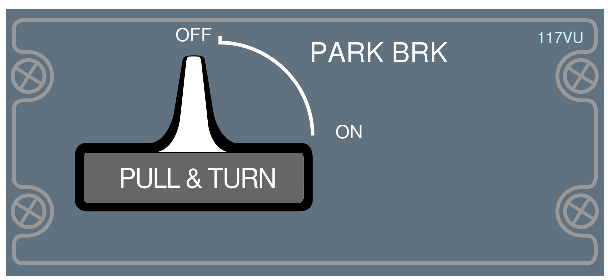

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Landing Gear
Brakes - Indication and Control
FIGURE-02-30-01-991-002-A01

****ON A/C A330-200 A330-300**

TASK 02-30-01-481-802-A02

Installation of the Safety Devices on Landing Gears

1. General

WARNING : LET THE BRAKES AND THE WHEELS BECOME COOL BEFORE YOU GO NEAR THE LANDING GEAR. DO NOT APPLY A LIQUID OR GAS FIRE EXTINGUISHER DIRECTLY ON A HOT WHEEL OR BRAKE UNIT. IF YOU DO NOT OBEY THESE PRECAUTIONS, THERE IS A RISK OF EXPLOSION.

WARNING : MAKE SURE THAT THE LANDING GEAR AND DOOR TRAVEL RANGES ARE CLEAR. MOVEMENT OF THE LANDING GEAR AND DOORS CAN CAUSE INJURY AND/OR DAMAGE.

WARNING : MAKE SURE THAT, IF THE LANDING GEAR DOORS ARE OPEN, THEY ARE SAFETIED BEFORE YOU INSTALL THE LANDING GEAR SAFETY-DEVICES. IF THE LANDING GEAR DOORS ARE OPEN BUT NOT SAFETIED THERE IS A RISK THAT THEY CAN CLOSE AND CAUSE INJURY.

WARNING : MAKE SURE THAT THE SAFETY DEVICES AND THE WARNING NOTICES ARE IN POSITION BEFORE YOU START A TASK ON OR NEAR THE FLIGHT CONTROLS, THE FLIGHT CONTROL SURFACES, THE LANDING GEARS AND RELATED DOORS AND COMPONENTS THAT MOVE. MOVEMENT OF COMPONENTS CAN KILL OR CAUSE INJURY TO PERSONS AND CAN CAUSE DAMAGE.

The chapter gives the recommended steps to install the safety devices on the landing gears and landing gear doors prior to recover the aircraft.
For the description of the landing gears, see 09-10-16.

2. Inspections
Not Applicable.

3. Job Setup References
Not Applicable.

4. Job Set-up Information

A. Fixtures, Tools, Test and Support Equipment

REFERENCE	DESIGNATION
460007174	PIN - GROUNDLOCK, MLG
D23304000	PIN - GROUNDLOCK, NLG
15461-103	PIN - GROUNDLOCK, CLG
30-1132001-00	PIN - GROUNDLOCK, NLG/CLG
30-1132004-00	PIN - GROUNDLOCK, NLG/CLG

REFERENCE	DESIGNATION
98F32204001001	COLLAR-SAFETY, NLG DOOR
98F32104013000	COLLAR-SAFETY, MLG DOOR
98F32104015000	COLLAR-SAFETY, CLG DOOR
98F32204003000	COLLAR-SAFETY, NLG DOOR
98F32104037000	COLLAR-SAFETY, CLG DOOR

Fixtures, Tools, Test and Support Equipment

TABLE 1

B. Referenced Information

REFERENCE	DESIGNATION
09-10-16	09-10-16-LANDING GEARS
04-20-00	04-20-00-STABILIZING THE AIRCRAFT
AMM 29-00-00-864-804	
AMM 32-16-00-010-801	
AMM 32-12-00-010-801	
AMM 32-22-00-010-801	
FIGURE 02-30-01-991-024-A	FIGURE 02-30-01-991-024-A-Landing Gear
FIGURE 02-30-01-991-026-A	FIGURE 02-30-01-991-026-A-Landing Gear Doors

Referenced Information

TABLE 2

5. Procedure

Subtask 02-30-01-869-003-A01

A. Preparation

(1) Safety Precautions

(a) Make sure that the aircraft is stable, see 04-20-00.

(b) Make sure that the MLG wheels are chocked where possible.

(c) Make sure that the Landing-Gear Control Lever (6GA) is in the DOWN position and put a warning notice to tell people not to operate the landing-gear control lever.

(d) Make sure that the Landing-Gear GRVTY Switches are in the OFF position.

(e) Make sure that the Green hydraulic system is depressurized, see AMM 29-00-00-864-804.

(2) Get Access

(a) Put the adjustable access platform adjacent to the applicable leg:
- the MLG, zone 731 (741).

- the NLG, zone 711.

Subtask 02-30-01-481-004-A01

B. Installation of the Safety Devices on the Landing Gears

(1) Installation of the Main Landing Gear Safety Locks:

(a) See FIGURE 02-30-01-991-024-A.

(b) Make sure that the holes in the MLG lock stay are aligned.

(c) Make sure that the 460007174 PIN - GROUNDLOCK, MLG is in a clean and serviceable condition.

(d) Push and hold the button on the 460007174 PIN - GROUNDLOCK, MLG and install it in the holes of the MLG lock stay.

(e) Make sure that the flag is in view from the ground.

(2) Installation of the Nose Landing Gear Safety Locks:

(a) See FIGURE 02-30-01-991-024-A.

(b) Make sure that the holes in the NLG lock stay are aligned.

(c) Make sure that the D23304000 PIN - GROUNDLOCK, NLG is in a clean and serviceable condition.

(d) Push and hold the button on the D23304000 PIN - GROUNDLOCK, NLG and install it in the holes of the NLG lock stay.

(e) Make sure that the flag is in view from the ground.

Subtask 02-30-01-481-005-A01

C. Installation of the Safety Devices on the Landing Gear Doors

(1) Installation of the safety devices on the Main Landing Gear Doors:

(a) See FIGURE 02-30-01-991-026-A.

(b) Open the MLG door, see AMM 32-12-00-010-801.

(c) Make sure that the piston rod of the MLG door actuator is clean.

(d) Remove the pins and open the 98F32104013000 COLLAR-SAFETY, MLG DOOR.

(e) Make sure that the 98F32104013000 COLLAR-SAFETY, MLG DOOR is clean and in the correct condition.

(f) Put the 98F32104013000 COLLAR-SAFETY, MLG DOOR in position on the piston rod of the MLG door actuator.

(g) Close the 98F32104013000 COLLAR-SAFETY, MLG DOOR around the piston rod.

(h) Push and hold the buttons of the pins and install them.

(i) Make sure that the flags are in view from the ground.

(2) Installation of the safety devices on the Nose Landing Gear Doors:

NOTE : Because each forward NLG door is hydraulically independent, you must install a 98F32204001001 COLLAR-SAFETY, NLG DOOR on each on both door actuators.

(a) See FIGURE 02-30-01-991-026-A.

(b) Open the NLG doors, see AMM 32-22-00-010-801.

(c) Make sure that the piston rod of the NLG door actuator is clean.

(d) Remove the pins and open each 98F32204001001 COLLAR-SAFETY, NLG DOOR.

(e) Make sure that the 98F32204001001 COLLAR-SAFETY, NLG DOOR is clean and in the correct condition.

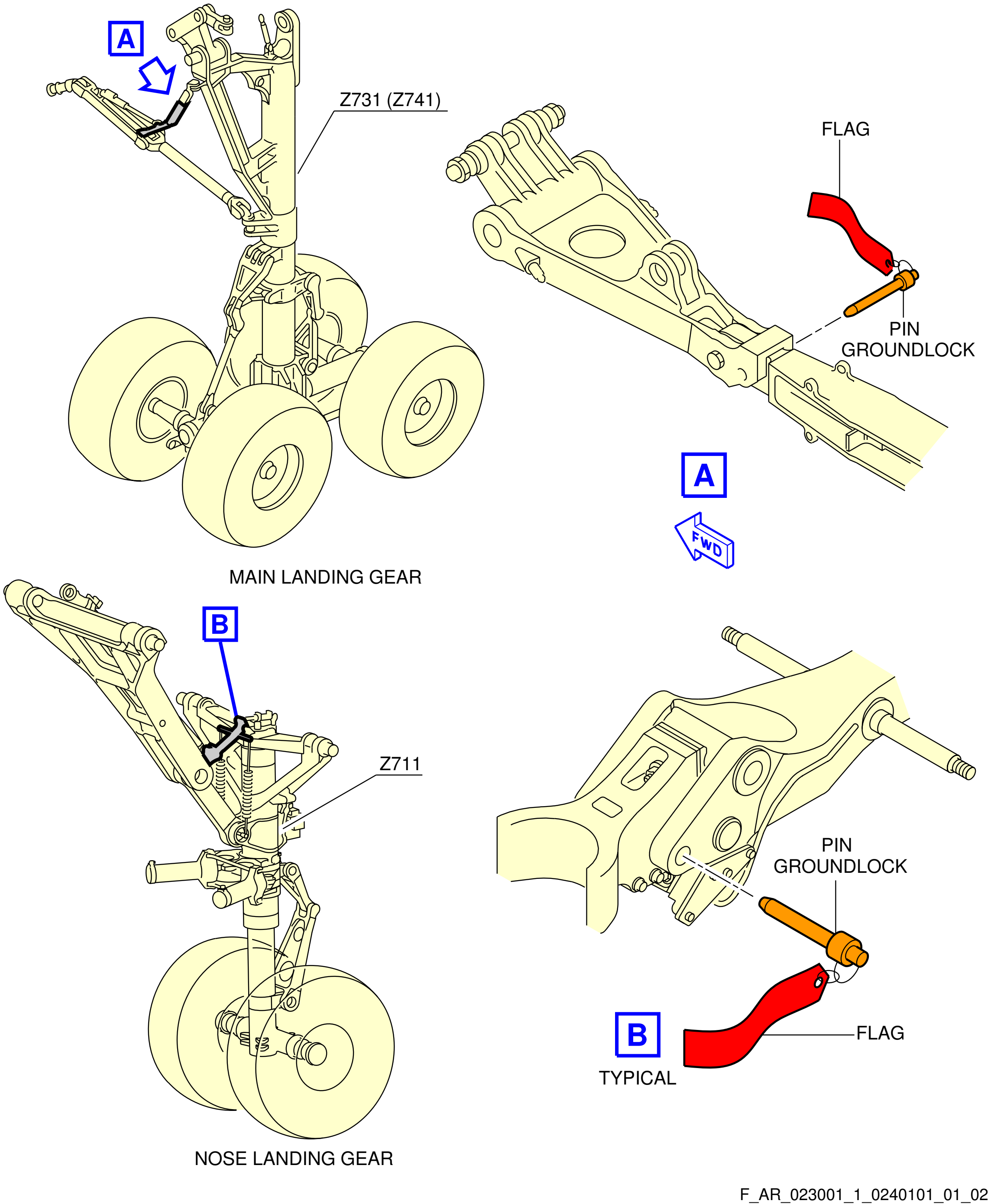
(f) Put the 98F32204001001 COLLAR-SAFETY, NLG DOOR in position on the piston rod of the MLG door actuator.

(g) Close the 98F32204001001 COLLAR-SAFETY, NLG DOOR around the piston rod.

(h) Push and hold the button of the pins and install them.

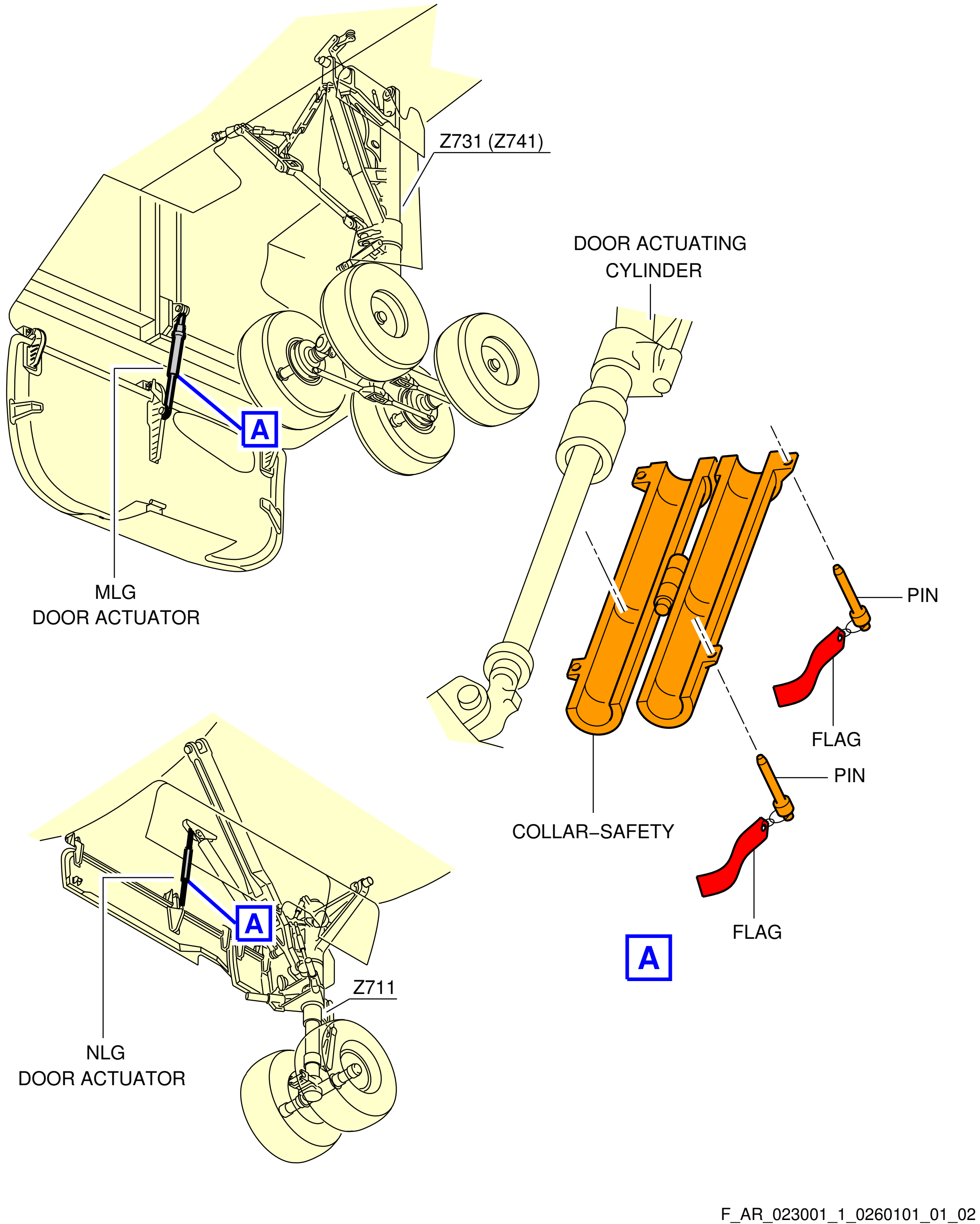
(i) Make sure that the flags are in view from the ground.

**ON A/C A330-200 A330-300



Landing Gear
Safety Devices of the MLG and NLG
FIGURE-02-30-01-991-024-A01

**ON A/C A330-200 A330-300



Landing Gear Doors
Safety Devices of the MLG Doors and NLG Doors
FIGURE-02-30-01-991-026-A01

****ON A/C A330-200 A330-300**

TASK 02-30-01-867-803-A01

Jacking for Wheel Change

1. General

WARNING : LET THE BRAKES AND THE WHEELS BECOME COOL BEFORE YOU GO NEAR THE LANDING GEAR. DO NOT APPLY A LIQUID OR GAS FIRE EXTINGUISHER DIRECTLY ON A HOT WHEEL OR BRAKE UNIT. IF YOU DO NOT OBEY THESE PRECAUTIONS, THERE IS A RISK OF EXPLOSION.

WARNING : MAKE SURE THAT THE GROUND SAFETY-LOCKS ARE CORRECTLY INSTALLED ON THE LANDING GEAR. THIS PREVENTS UNWANTED MOVEMENT OF THE LANDING GEAR.

CAUTION : DO NOT DO THIS JACKING FOR WHEEL CHANGE PROCEDURE DURING REFUELING OR DEFUELING PROCEDURES. IF THE AIRCRAFT IS ON JACKS AND IF A FIRE OR IMPORTANT FUEL SPILLAGE OCCURS IT WILL NOT BE POSSIBLE TO MOVE THE AIRCRAFT.

This procedure gives details for the replacement of the wheels.

2. Inspections
Not Applicable.

3. Job Setup References
Not Applicable.

4. Job Set-up Information

A. Fixtures, Tools, Test and Support Equipment

REFERENCE	DESIGNATION
GSE	NLG WHEEL JACK

Fixtures, Tools, Test and Support Equipment

TABLE 1

B. Referenced Information

REFERENCE	DESIGNATION
04-20-00	04-20-00-STABILIZING THE AIRCRAFT
AMM 32-41-12PB401	
AMM 32-41-11PB401	
AMM 32-41-13PB401	
FIGURE 02-30-01-991-020-A	FIGURE 02-30-01-991-020-A-Jacking for Wheel Change
FIGURE 02-30-01-991-021-A	FIGURE 02-30-01-991-021-A-Jacking for Wheel Change

REFERENCE	DESIGNATION
FIGURE 02-30-01-991-022-A	FIGURE 02-30-01-991-022-A-Jacking for Wheel Change

Referenced Information

TABLE 2

5. Procedure

Subtask 02-30-01-869-001-A01

A. Safety Precautions

(1) Make sure that the aircraft is stable before you do any jacking operation, see 04-20-00.

(2) Make sure that the wheels are on the aircraft axis.

Subtask 02-30-01-581-001-A01

B. Jacking for Wheel Change of the Nose Landing Gear

(1) Put the wheel chocks in position at the MLG wheels.

(2) See TABLE 3 for specification of the wheel jack.
The aircraft can be lifted at its maximum takeoff weight.

CAPACITY (MIN)	CLOSED HEIGHT (MAX)	HYDRAULIC STROKE (MIN)	WIDTH (MAX)
28 000 daN (62 947 lbf)	170 mm (6.69 in)	285 mm (11.23 in)	180 mm (7.09 in)

Specification of the Wheel Jack

TABLE 3

(3) Put the GSE NLG WHEEL JACK in position and adjust the GSE NLG WHEEL JACK until its adapter touches the ball pad, see FIGURE 02-30-01-991-020-A.

NOTE : The size of the jacking ball is 3/4 inch.

(4) Make sure that the GSE NLG WHEEL JACK is stable and in the vertical position.

(5) Slowly operate the GSE NLG WHEEL JACK to lift the tire off the ground.

(6) Change the wheel, see AMM 32-41-12PB401.

(7) Slowly operate the GSE NLG WHEEL JACK to lower the NLG.

(8) When the aircraft is on its wheels, remove the GSE NLG WHEEL JACK.

Subtask 02-30-01-581-002-A01

C. Jacking for Wheel Change of the Main Landing Gear

(1) Put the wheel chocks in position at the NLG and at the MLG, on the side where you do not remove the wheels.

(2) See TABLE 4 and TABLE 5 for specification of the wheel jack.
The aircraft can be lifted at its maximum takeoff weight.

(a) Case of two inflated wheel tires and two deflated wheel tires:

CAPACITY (MIN)	CLOSED HEIGHT (MAX)	HYDRAULIC STROKE (MIN)	WIDTH (MAX)
60 000 daN (134 886 lbf)	190 mm (7.49 in)	410 mm (16.15 in)	690 mm (27.17 in)

Specification of the Wheel Jack

TABLE 4

(b) Case of four deflated wheel tires:

CAPACITY (MIN)	CLOSED HEIGHT (MAX)	HYDRAULIC STROKE (MIN)	WIDTH (MAX)
65 000 daN (146 126 lbf)	118.5 mm (4.67 in)	495 mm (19.49 in)	690 mm (27.17 in)

Specification of the Wheel Jack

TABLE 5

(3) Put the GSE MLG WHEEL JACK in position, see FIGURE 02-30-01-991-021-Aand FIGURE 02-30-01-991-022-A.

(a) If there are two deflated wheel tires and two inflated wheel tires:
- put the GSE MLG WHEEL JACK in position on the side where the tires are deflated so that the adapter touches the ball pad of the bogie.

If the two aft wheel tires are deflated:
- it is mandatory to lift the landing gear from the aft of the bogie.

NOTE : The size of the jacking ball is 3/4 inch.

(b) You can lift the two axles of the bogie beam of the same MLG at the same time if you keep the bogie beam in a more or less level position to prevent extension of the pitch trimmer on to its outstop.

(c) You can lift the two bogie beams of the two MLGs at the same time if you obey the instructions that follow.
If all the tires are deflated and if you lift each axle independently, you must:
- lift the aft axles first,

- change the aft tires before you lift the forward axles,
- keep the aft jack in position while you lift the forward axles to prevent too much loads on the aft axles.

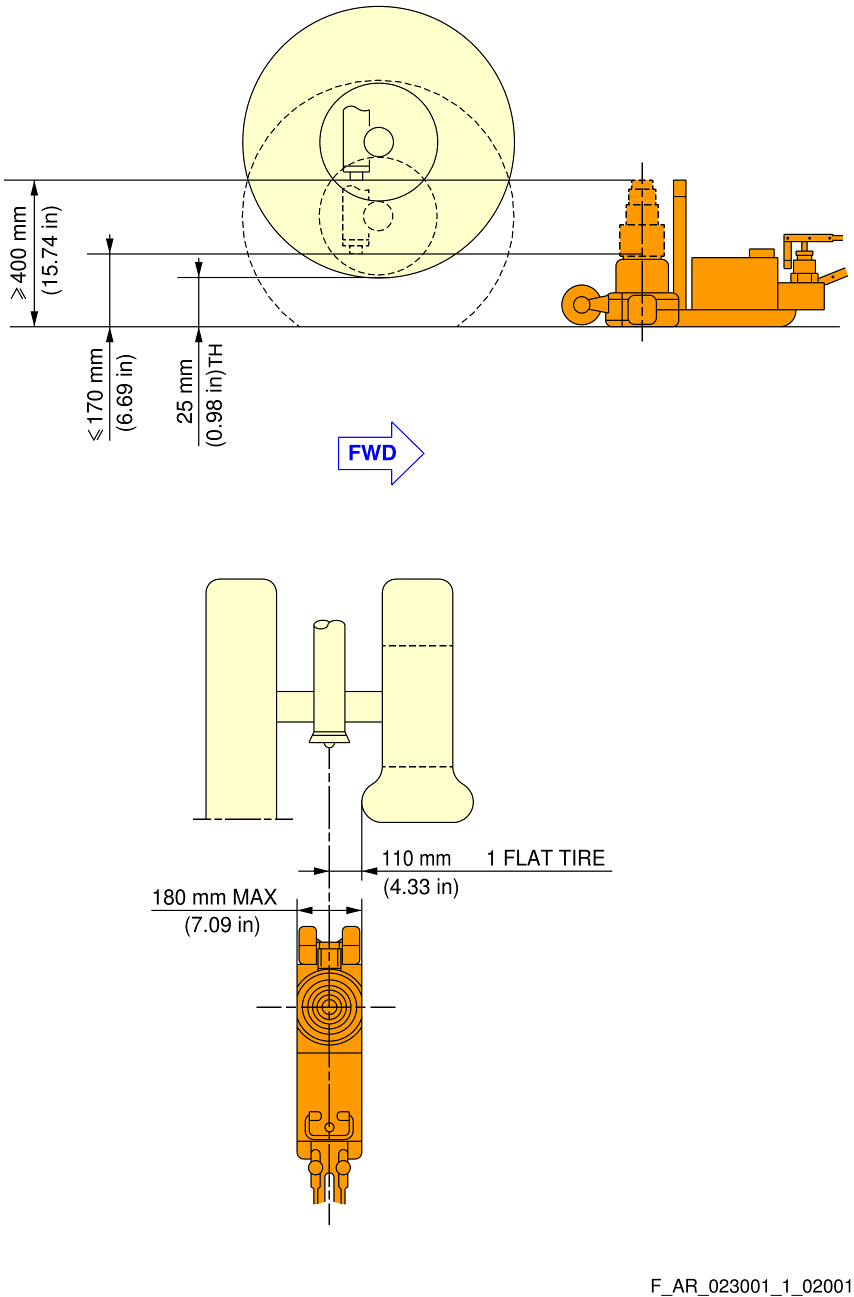
(4) Slowly operate the GSE MLG WHEEL JACK to lift the tire off the ground with a ground clearance of approximately 25 mm (0.98 in).

(5) Change the wheel, see AMM 32-41-11PB401.

(6) Slowly operate the GSE MLG WHEEL JACK to lower the MLG.

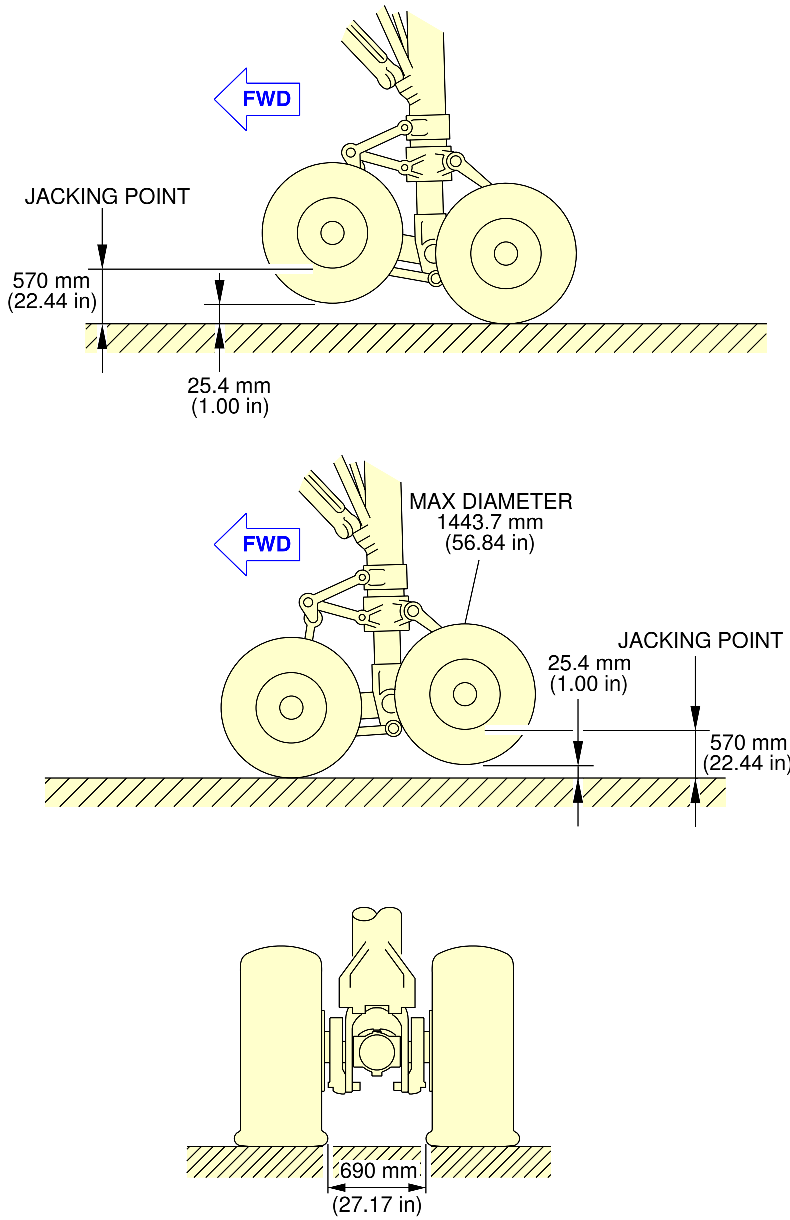
(7) When the aircraft is on its wheels, remove the GSE MLG WHEEL JACK.

**ON A/C A330-200 A330-300



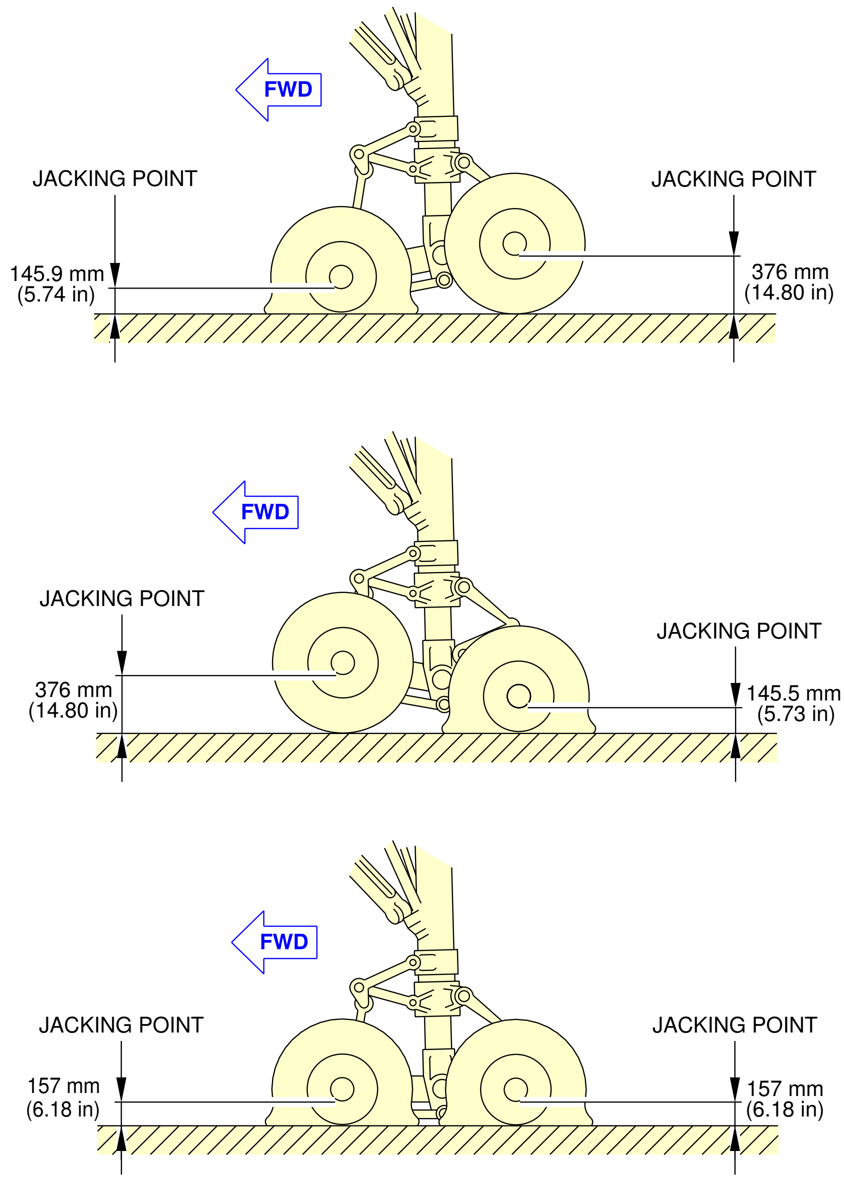
Jacking for Wheel Change
Jacking of the Nose Landing Gear
FIGURE-02-30-01-991-020-A01

**ON A/C A330-200 A330-300



Jacking for Wheel Change
Jacking of the Main Landing Gear
FIGURE-02-30-01-991-021-A01

**ON A/C A330-200 A330-300



Jacking for Wheel Change
Jacking of the Main Landing Gear with Flat Tires
FIGURE-02-30-01-991-022-A01

02-40 HEALTH AND SAFETY ISSUES

02-40-01 HEALTH AND SAFETY ISSUES

****ON A/C A330-200 A330-300**

DESC 02-40-01-001-A01

General

1. The emphasis during all aircraft recovery operations is SAFETY. All necessary precautions must be taken to avoid injury to personnel and the occurrence of secondary damage to the aircraft. Not only the members of aircraft recovery team, but everyone at the incident site must know all the safety issues as they evolve. A number of different factors must be taken into account to make sure the safety issue is properly controlled.
   Make sure that adherence to a recovery close loop process is ensured to control and set up mitigation plan if needed. By definition this implies that recovery plan engineering, tooling capability and personnel qualification or expertise are correctly assessed.
   Paragraphs are not in order of importance.

   A. Communication
      Make sure sufficient and correct communication equipment is available for communication at the recovery site. Communication equipment can include two-way radios and cell phones. Voice activated, lightweight headsets with microphones are ideal for recovery operations. Extra batteries or a power supply must be available.
      A direct link with the air traffic control service will most likely be required, depending on the location of the incident site. The main problem will be to cross active runways and taxiways in order to access the incident or accident site. In most cases the local air traffic control service will provide an alternative access route to the site in order to reduce the amount of communication.
      It is absolutely mandatory that lines of communication are established and kept open between all groups at the site, including the recovery team, fire department, Investigative Authority, police, airport personnel and any contracted assistance.
      Short briefing sessions must be held between all groups and parties involved with the recovery process. These briefings will alert personnel to the upcoming steps, and to any possible hazards and dangers.

   B. Personnel
      It should be understood that the aircraft is by definition not under normal maintenance or operational status. Therefore its recovery involves multiple personnel/parties competencies, which have not necessarily worked previously together and do not know each other's constraints-outcomes. As parties have incompatible goals it is of prime importance that the recovery manager ensure that information, caution etc are well understood and put in practice by all.
      All personnel at the incident site must have proper and adequate personal protective clothing and equipment. This will change greatly if the existing climate and weather conditions change.

Examples: Safety boots, personal breathing mask, rainwear, parkas and gloves, etc.
Personnel must be kept at a safe distance during any leveling/lifting operation. The recovery manager must make sure that the personnel knows the dangers of steel cable during pulling and winching operations, as well as dangers arising due to the nature of the corrective actions embodiment.
Make sure that everyone knows the dangers of going into, climbing-on or going below the aircraft until it is stable and or adequately shored.
First-aid kits must be available at the site to cope with minor injuries. Detailed information on how to contact and arrange for emergency medical attention must be available.

WARNING : MAKE SURE THAT THE AIRCRAFT IS CORRECTLY GROUNDED.

WARNING : MAKE SURE THAT THE AIRCRAFT ELECTRICAL NETWORK IS DE-ENERGIZED BEFORE YOU DISCONNECT THE EXTERNAL POWER CONNECTOR. IF YOU DISCONNECT THE EXTERNAL POWER CONNECTOR WHEN THE ELECTRICAL NETWORK IS ENERGIZED, DANGEROUS ARCING CAN OCCUR.

CAUTION : MAKE SURE THAT THE AIRCRAFT ELECTRICAL NETWORK IS DE-ENERGIZED BEFORE YOU DISCONNECT THE EXTERNAL POWER CONNECTOR. IF YOU DO NOT DO SO, THERE IS A RISK OF ARCING AND THIS CAN CAUSE DAMAGE TO THE AIRCRAFT.

C. Electrical Systems

If you took the decision to leave the aircraft with the batteries connected, do an investigation before you energize the circuits. Leaving the batteries connected can help during the different steps of the recovery process.
Before you use external aircraft power-supply to help the recovery operations, make sure that the systems are serviceable.
If the aircraft structure is damaged, it is better to disconnect the batteries and not to try energize the aircraft with the external supply.

WARNING : MAKE SURE THAT YOU OBEY ALL THE APPLICABLE SAFETY PRECAUTIONS WHEN YOU WORK ON THE OXYGEN SYSTEM OR WITH OXYGEN EQUIPMENT.

D. Oxygen Systems

When the aircraft is stable and it is possible to get into the aircraft, make sure that the oxygen bottle valves in the cockpit and cabin are closed. If they are not, close them manually. If possible, remove the bottles from the aircraft. Take the decision as to remove or secure the oxygen generators. As this is a time-consuming task, this decision will be based on the current dangers involved, the condition of the aircraft and the time available.

WARNING : MAKE SURE THAT YOU OBEY ALL THE APPLICABLE SAFETY PRECAUTIONS WHEN YOU REMOVE FUEL OR WHEN YOU WORK IN AN ENVIRONMENT WHERE THERE IS FUEL.

WARNING : MAKE SURE THAT THE TANKER AND THE AIRCRAFT ARE CONNECTED TO AN APPROVED GROUND AND THAT ELECTRICAL BONDING BETWEEN THE AIRCRAFT AND THE TANKER IS CONNECTED. ONLY IF THESE CONDITIONS ARE MET, YOU CAN CONNECT FUEL HOSES OR ADAPTERS BETWEEN THE AIRCRAFT AND THE FUEL TANKER.

E. Defueling

Make sure that only qualified and approved personnel is near the aircraft during the defuel process. Steps should be taken to have the Fire Department stand by until the end of this process.
If there is any sign of fuel leaks, a hazardous materials team must try to contain any fuel leakage.

F. Equipment

Make sure that contracted assistance, such as heavy-equipment operators, become part of the group safety team approach and are briefed on all relative safety issues. Keep in mind that most heavy-equipment operators never worked near an aircraft. It is necessary give them relevant safety issues. Discuss with these operators the concerns of overloading equipment and the subsequent possible dangers. Most heavy-equipment operators know these concerns but not as they relate to the aircraft. These discussions can include areas such as maximum lifting loads during crane lifts. Maximum jacking point loads and pneumatics lifting bags loading figures and charts must be available.

G. Recovery Operations

Make sure that all equipment in use is properly rated for the loaded anticipated. Make sure that the aircraft is stable during all the recovery actions and that tooling used will not cause aircraft instability. Adherence to maximum wind speeds is required during lifting and leveling operations. AIRBUS recommends that all loads imposed on the aircraft during a recovery operation must be recorded. If it is not possible to record the loads, record all the steps used to make sure that you do not exceed maximum loads. This will have a direct impact on corrective actions to do for return to service.

WEIGHT AND CG MANAGEMENT

03-00 WEIGHT AND CG MANAGEMENT

03-00-00 WEIGHT AND CG MANAGEMENT

****ON A/C A330-200 A330-300**

TASK 03-00-00-558-801-A01

General

1. General
The aim is to calculate the weight of the aircraft and the CG location in order to anticipate aircraft stability changes.
The weight of the aircraft and the CG location are the basic data used to calculate the expected loads and to select a recovery technique (selection of tooling and equipment).
The choice of a leveling/lifting scenario (see 06-60-00) and the use of the logic chart (see 09-20-01) will help to control aircraft weight and CG.

2. Inspections
Not Applicable.

3. Job Setup References
Use aircraft reference axes, glossary of terms (see 09-10-02) and the aircraft reference OEW or DOW.

   A. Worksheet Principle
   The worksheets are used to calculate the NRW and moments.
   Chapter 03-60-01 gives the source of the specific data used to complete the "interim worksheets" and calculate the final NRW.
   The NRW and CG worksheet indicates in front of each item which ARM chapter will give relevant data to allow completion of "interim worksheets" and final NRW calculation.
   It is understood that NRW, CG position and calculation of expected loads will not be accurate if generic data is used for the OEW, H-arm and Y-arm data.
   It should be noted that the OEW or DOW and the H-arm and Y-arm apply to a specific aircraft with all landing gears extended, flight controls retracted and thrust reversers in stowed position.
   See 09-50-01 for the calculation worksheets.

4. Job Set-up Information

   A. Referenced Information

REFERENCE	DESIGNATION
06-60-00	06-60-00-LEVELING AND LIFTING SCENARIOS
09-20-01	09-20-01-QUICK REFERENCE DATA
09-10-02	09-10-02-GLOSSARY OF TERMS
03-60-01	03-60-01-REFERENCE FOR CALCULATION

REFERENCE	DESIGNATION
09-50-01	09-50-01-WEIGHT AND CG CALCULATION WORKSHEETS
FIGURE 03-00-00-991-002-A	FIGURE 03-00-00-991-002-A-CG Conversion Principle
FIGURE 03-00-00-991-002-B	FIGURE 03-00-00-991-002-B-CG Conversion Principle

Referenced Information

TABLE 1

5. Procedure

WARNING : MAKE SURE THAT ALL PERSONNEL IS AT A SAFE DISTANCE DURING THE REMOVAL OF FUEL, CARGO OR LARGE COMPONENTS. AN UNEQUAL REMOVAL OF FUEL OR CARGO OR THE REMOVAL OF LARGE COMPONENTS CAN CHANGE THE CG AND THE LONGITUDINAL AND LATERAL STABILITY OF THE AIRCRAFT. DEATH OR SERIOUS INJURY MAY RESULT IF THE AIRCRAFT FALLS ON RECOVERY PERSONNEL.

WARNING : YOU MUST MONITOR AIRCRAFT STABILITY, WEIGHT AND CG DURING THE RECOVERY PROCESS.

NOTE : It is important to use accurate data for the calculation related to the recovery process. Some of the necessary data is the responsibility of the operator and to be accurate, it must be applicable to the specific MSN involved. Data supplied by the manufacturer as generic data is not necessarily accurate for a specific MSN. Refer to the operator's documentation for precise calculations.
If some of the necessary data is not available or if it is not possible to get it, then it is the responsibility of the recovery manager to decide to use estimated data and to continue with the process.

****ON A/C A330-200**

Subtask 03-00-00-558-001-A01

A. CG Conversion Principle

(1) The CG location (in the longitudinal axis) can be expressed in % of the Reference Chord (%RC) or in lever arm distance (H-arm). See FIGURE 03-00-00-991-002-A.
In this manual, the lever arm distance (H-arm and Y-arm) is used to calculate the CG location calculation.

(a) Use the formula that follows to convert the CG expressed in %RC from other manuals into H-arm.
- H-arm (in meters) = (%RC × 0.0727) + 31.338
- H-arm (in inches) = (%RC × 2.8622) + 1233.780

(b) Use the formula that follows to convert H-arm into %RC.
- %RC = (H-arm – 31.338) / 0.0727 (H-arm in meters)
- %RC = (H-arm – 1233.780) / 2.8622 (H-arm in inches)

****ON A/C A330-300**

Subtask 03-00-00-558-001-B01

A. CG Conversion Principle

(1) The CG location (in the longitudinal axis) can be expressed in % of the Reference Chord (%RC) or in lever arm distance (H-arm). See FIGURE 03-00-00-991-002-B.
In this manual, the lever arm distance (H-arm and Y-arm) is used to calculate the CG location calculation.

(a) Use the formula that follows to convert the CG expressed in %RC from other manuals into H-arm.
- H-arm (in meters) = (%RC $\times$ 0.0727) + 34.532
- H-arm (in inches) = (%RC $\times$ 2.8622) + 1359.528

(b) Use the formula that follows to convert H-arm into %RC.
- %RC = (H-arm – 34.532) / 0.0727 (H-arm in meters)
- %RC = (H-arm – 1359.528) / 2.8622 (H-arm in inches)

****ON A/C A330-200 A330-300**

Subtask 03-00-00-970-001-A01

B. Principle of the NRW and Related CG Position Calculation

NOTE : All calculations are based on OEW or DOW aircraft configuration and related CG. The weight differences between the OEW or DOW and the real status of the aircraft are then recorded on calculation worksheets. The data on these worksheets is used to calculate the NRW and CG location of the aircraft.

(1) Find the weight and calculate the related H-arm moment of a known aircraft configuration (OEW or DOW).

NOTE : For the OEW or DOW configuration, the Y-arm = 0.

(2) Record the values on the NRW and CG worksheet (see 09-50-01) applicable to the configuration (OEW or DOW) that you will use for the calculation.

(3) For each item on the NRW and CG worksheet, use the related chapter and related interim worksheet to record the weight, the H-arm moment and the Y-arm moment of each item which remains on the aircraft, which is removed or missing from the aircraft and which has an effect on the known OEW or DOW.

NOTE : It is considered that the Y-arm of components located inside the fuselage is negligible for the calculation made, therefore they are ignored.

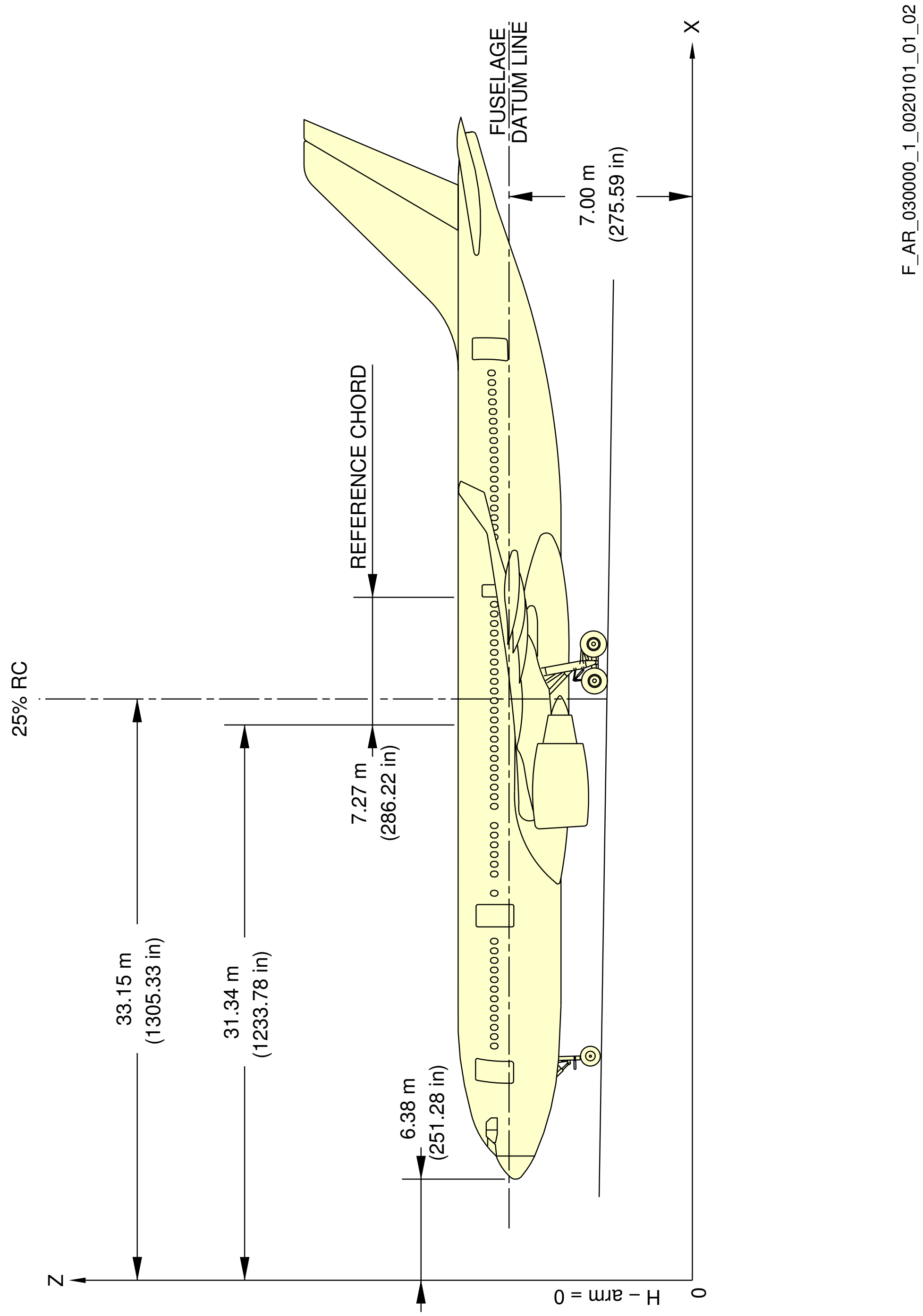
NOTE : The ARM gives all necessary data (for each scenario) to allow completion of interim worksheet.

(4) Use the "NRW and Related H and Y Moment" worksheet (see 09-50-01) to find the NRW, the total H-arm moment and the total Y-arm moment.
NET RECOVERABLE WEIGHT =
TOTAL H-ARM MOMENT =
TOTAL Y-ARM MOMENT =

(5) Divide the "total H-arm moment" value by the NRW value to find the longitudinal CG position (XG).
(LONGITUDINAL CG POSITION) XG =

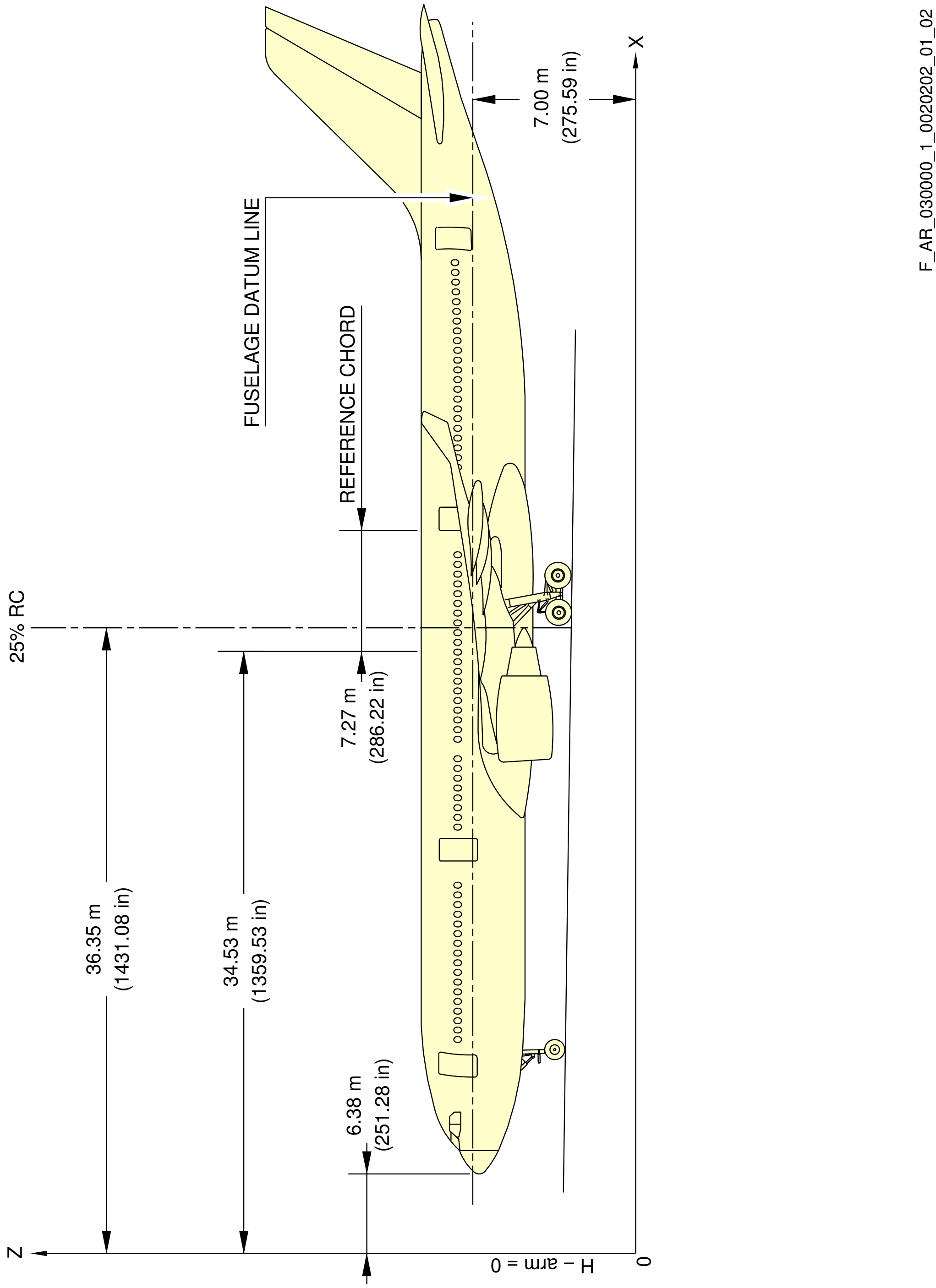
(6) Divide the "total Y-arm moment value" by the NRW value to find the lateral CG position (YG).
(LATERAL CG POSITION) YG =

**ON A/C A330-200



CG Conversion Principle
Reference Chord Data
FIGURE-03-00-00-991-002-A01

**ON A/C A330-300



CG Conversion Principle
Reference Chord Data
FIGURE-03-00-00-991-002-B01

03-20 FUEL LOAD AND CG CONTROL

03-20-01 FUEL LOAD AND CG CONTROL

****ON A/C A330-200 A330-300**

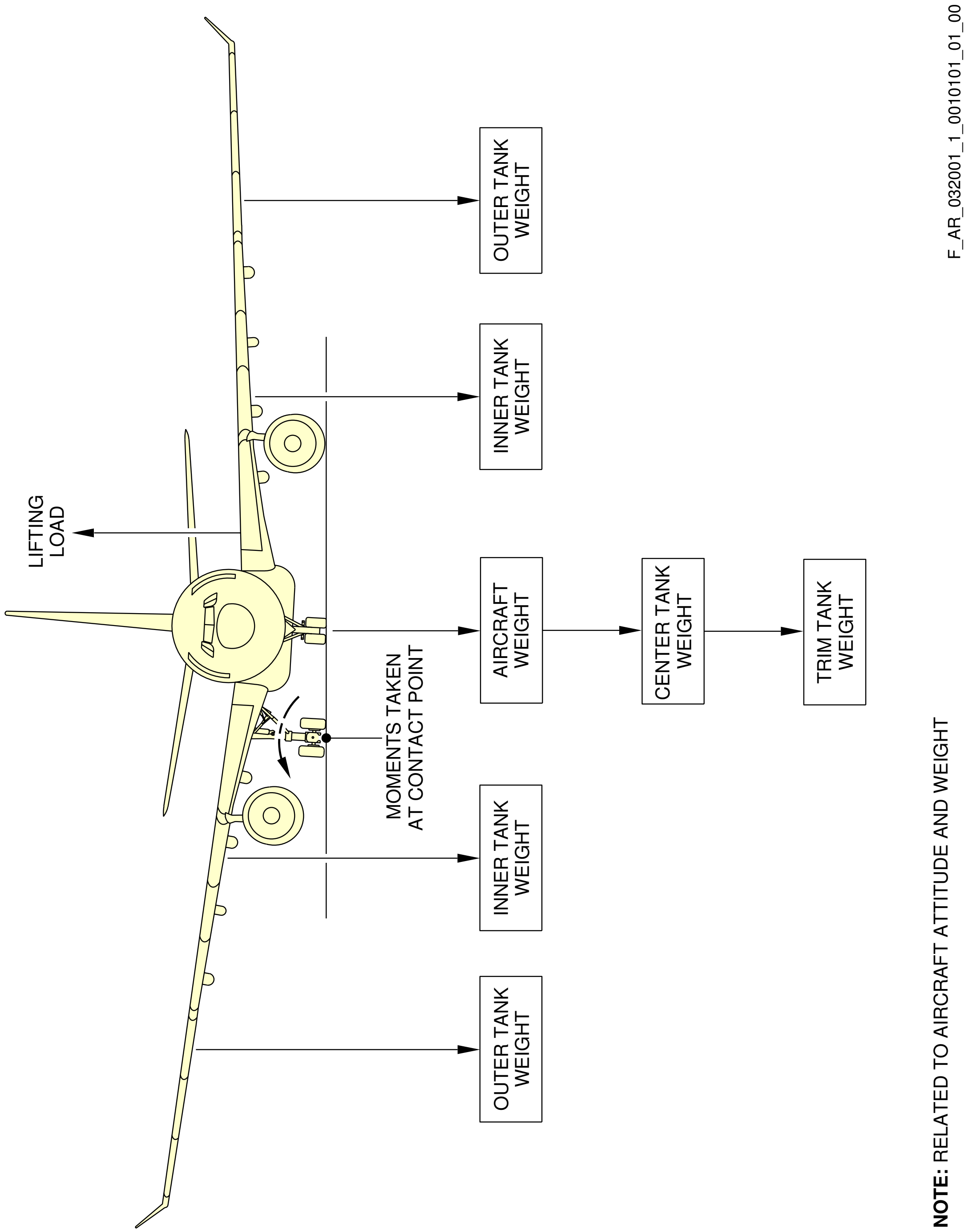
DESC 03-20-01-001-A01

General

1. To safely level or lift a damaged aircraft so that it can be moved on it's own Landing Gear (or on a suitable ground equipment trailer) you must establish the weight and center of gravity (CG) of the aircraft.
   This chapter contains the method and calculations needed to establish the effect of the fuel load on the position of the aircraft CG. The weight and CG positions of the aircraft will change due to the quantity of fuel in each tank. To find the changes in weight and CG position, calculate:
   - The H-arm dimension along the longitudinal plane from nose to tail
     (H-arm is a dimension from the CG of an item/component to the horizontal reference datum plane)
   - The Y-arm dimension along the lateral plane from wing tip to wing tip
     (Y-arm is a dimension from the CG of an item/component to the lateral arm reference datum plane).

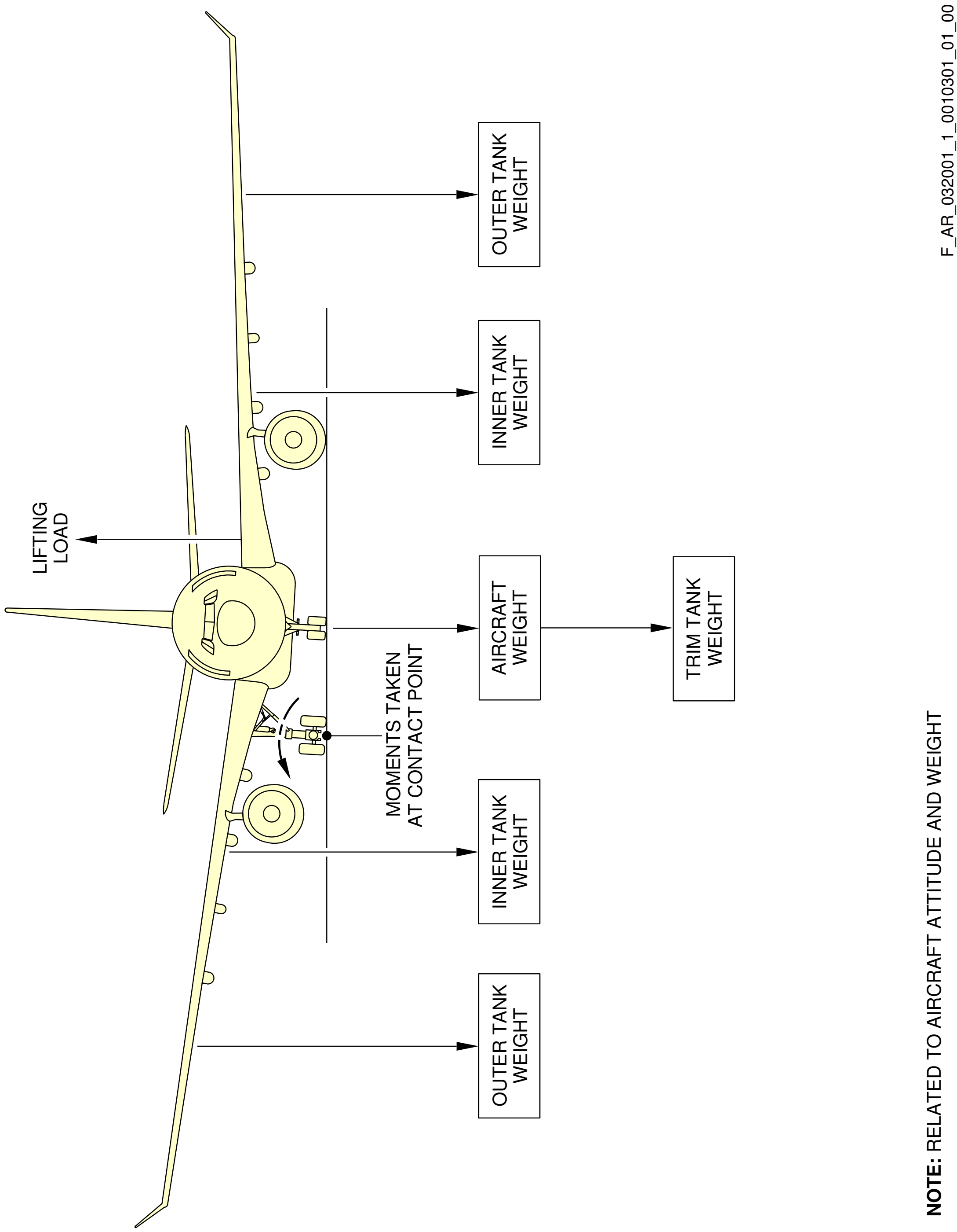
   The tables (see DESC 03-20-01-002-A01) in this chapter contain fuel weight and CG data for selected incremental fuel volumes for each fuel tank and for each scenario (when applicable).

**ON A/C A330-200



Aircraft Loads
Type and Position of Loads Acting on the Aircraft
FIGURE-03-20-01-991-001-A01

**ON A/C A330-300



Aircraft Loads
Type and Position of Loads Acting on the Aircraft
FIGURE-03-20-01-991-001-C01

****ON A/C A330-200 A330-300**

DESC 03-20-01-002-A01

Tables

1. How to Find the Weight and Associated CG Position of Remaining Fuel
To find the weight and associated CG of remaining fuel on board, you must know the quantity of fuel remaining in each tank. If you do not know the quantity of fuel remaining in each tank see 03-20-02 for information about how to assess the fuel quantity without serviceable aircraft systems.
Using the fuel quantity, you must determine the weight and moment (generated by H-arm and Y-arm) of the fuel, using the applicable table.
When you have found the data from the relevant tables, enter this data in the fuel remaining onboard effect 'worksheet' boxes (see DESC 09-50-01-001-A01 for calculation worksheets) with the weight, the H-arm moment and the Y-arm moment values for the remaining fuel in each tank.
For the following tables (when applicable):
   - Unsuckable means "The quantity of fuel that remains after a defuel using the suction pumps on the Fuel Tanker"
   - Unpumpable means "The quantity of fuel that remains after a defuel using the aircraft fuel pumps"
   - Undrainable means "The quantity of fuel that remains after the final defuel procedure using the Water Drain Valves".

   For information on defuel procedures, see 05-10-00.

****ON A/C A330-200**

2. Tables

   NOTE : The tables that follow, give estimated values to help you estimate the CG position. The values are calculated without any pitch or roll angle of the aircraft.
   Accurate data are related to your aircraft configuration.

   The following tables give the H-arm and Y-arm related to important fuel capacities.

   NOTE : Fuel density used in calculations is: 0.785 kg/liter and 1.7306138 lb/liter.

Outer Tank				
Fuel	Volume Liters (US Gal)	Weight kg (lb)	H-arm Moment Kg.m (lb.in)	Y-arm Moment Kg.m (lb.in)
Full	3 650 (964)	2 865 (6 317)	110 538 (9 594 314)	57 623 (5 001 458)
3/4	2 800 (740)	2 198 (4 846)	83 990 (7 290 006)	42 727 (3 708 532)
1/2	1 800 (476)	1 413 (3 115)	53 491 (4 642 772)	26 518 (2 301 640)

Outer Tank				
Fuel	Volume Liters (US Gal)	Weight kg (lb)	H-arm Moment Kg.m (lb.in)	Y-arm Moment Kg.m (lb.in)
1/4	800 (211)	628 (1 385)	23 619 (2 050 045)	11 501 (998 205)

Outer Tank

TABLE 1

Inner Tank				
Fuel	Volume Liters (US Gal)	Weight kg (lb)	H-arm Moment Kg.m (lb.in)	Y-arm Moment Kg.m (lb.in)
Full	42 000 (11 095)	32 970 (72 686)	1 055 732 (91 633 499)	241 472 (20 958 863)
3/4	31 600 (8 348)	24 806 (54 688)	773 650 (67 149 796)	140 873 (12 227 257)
1/2	20 800 (5 495)	16 328 (35 997)	503 066 (43 664 161)	77 133 (6 694 888)
1/4	10 400 (2 747)	8 164 (17 999)	249 998 (21 698 863)	33 415 (2 900 315)

Inner Tank

TABLE 2

Center Tank				
Fuel	Volume Liters (US Gal)	Weight kg (lb)	H-arm Moment Kg.m (lb.in)	Y-arm Moment Kg.m (lb.in)
Full	41 560 (10 979)	32 625 (71 925)	971 397 (84 313 555)	0
3/4	31 200 (8 242)	24 492 (53 996)	733 682 (63 680 799)	0
1/2	20 800 (5 495)	16 328 (35 997)	490 118 (42 540 316)	0

Center Tank				
Fuel	Volume Liters (US Gal)	Weight kg (lb)	H-arm Moment Kg.m (lb.in)	Y-arm Moment Kg.m (lb.in)
1/4	10 400 (2 747)	8 164 (17 999)	246 765 (21 418 256)	0

Center Tank

TABLE 3

Trim Tank				
Fuel	Volume Liters (US Gal)	Weight kg (lb)	H-arm Moment Kg.m (lb.in)	Y-arm Moment Kg.m (lb.in)
Full	6 230 (1 646)	4 891 (10 782)	292 934 (25 425 556)	
3/4	4 800 (1 268)	3 768 (8 307)	224 034 (19 445 285)	0
1/2	3 200 (845)	2 512 (5 538)	148 502 (12 889 393)	0
1/4	1 600 (423)	1 256 (2 769)	74 045 (6 426 818)	0

Trim Tank

TABLE 4

ON A/C A330-300

3. Tables

NOTE : The tables that follow, give estimated values to help you estimate the CG position. The values are calculated without any pitch or roll angle of the aircraft.
Accurate data are related to your aircraft configuration.

The following tables give the H-arm and Y-arm related to important fuel capacities.

NOTE : Fuel density used in calculations is: 0.785 kg/liter and 1.7306138 lb/liter.

A. Valid for Aircraft Models ST6 (WV000-WV014)

Outer Tank				
Fuel	Volume Liters (US Gal)	Weight kg (lb)	H-arm Moment Kg.m (lb.in)	Y-arm Moment Kg.m (lb.in)
Full	3 624 (957)	2 845 (6 272)	118 798 (10 311 180)	57 150 (4 960 399)
3/4	2 800 (740)	2 198 (4 846)	91 010 (7 899 351)	42 727 (3 708 532)
1/2	1 800 (476)	1 413 (3 115)	58 004 (5 034 493)	26 518 (2 301 640)
1/4	800 (211)	628 (1 385)	25 625 (2 224 144)	11 501 (998 206)

Outer Tank

TABLE 5

Inner Tank				
Fuel	Volume Liters (US Gal)	Weight kg (lb)	H-arm Moment Kg.m (lb.in)	Y-arm Moment Kg.m (lb.in)
Full	41 904 (11 070)	32 895 (72 520)	1 158 056 (100 514 779)	240 295 (20 856 710)
3/4	31 600 (8 348)	24 806 (54 688)	852 880 (74 026 686)	140 873 (12 227 257)
1/2	20 800 (5 495)	16 328 (35 997)	555 217 (48 190 722)	77 133 (6 694 888)
1/4	10 400 (2 747)	8 164 (17 999)	276 074 (23 962 144)	33 415 (2 900 315)

Inner Tank

TABLE 6

Trim Tank				
Fuel	Volume Liters (US Gal)	Weight kg (lb)	H-arm Moment Kg.m (lb.in)	Y-arm Moment Kg.m (lb.in)
Full	6 115 (1 615)	4 800 (10 583)	312 911 (27 159 445)	0-

Trim Tank				
Fuel	Volume Liters (US Gal)	Weight kg (lb)	H-arm Moment Kg.m (lb.in)	Y-arm Moment Kg.m (lb.in)
3/4	4 600 (1 215)	3 611 (7 961)	233 747 (20 288 360)	0
1/2	3 000 (793)	2 355 (5 192)	151 700 (13 166 947)	0
1/4	1 600 (423)	1 256 (2 769)	80 736 (7 007 546)	0

Trim Tank

TABLE 7

B. Valid for Aircraft Models ST8 (WV020-WV053)

Outer Tank				
Fuel	Volume Liters (US Gal)	Weight kg (lb)	H-arm Moment Kg.m (lb.in)	Y-arm Moment Kg.m (lb.in)
Full	3 650 (964)	2 865 (6 317)	119 690 (10 388 638)	57 623 (5 001 458)
3/4	2 800 (740)	2 198 (4 846)	91 010 (7 899 351)	42 727 (3 708 532)
1/2	1 800 (476)	1 413 (3 115)	58 004 (5 034 493)	26 518 (2 301 640)
1/4	800 (211)	628 (1 385)	25 625 (2 224 144)	11 501 (998 206)

Outer Tank

TABLE 8

Inner Tank				
Fuel	Volume Liters (US Gal)	Weight kg (lb)	H-arm Moment Kg.m (lb.in)	Y-arm Moment Kg.m (lb.in)
Full	42 000 (11 095)	32 970 (72 686)	1 161 039 (100 773 670)	241 472 (20 958 863)
3/4	31 600 (8 348)	24 806 (54 688)	852 880 (74 026 686)	140 873 (12 227 257)

Inner Tank				
Fuel	Volume Liters (US Gal)	Weight kg (lb)	H-arm Moment Kg.m (lb.in)	Y-arm Moment Kg.m (lb.in)
1/2	20 800 (5 495)	16 328 (35 997)	555 217 (48 190 722)	77 133 (6 694 888)
1/4	10 400 (2 747)	8 164 (17 999)	276 074 (23 962 144)	33 415 (2 900 315)

Inner Tank

TABLE 9

Trim Tank				
Fuel	Volume Liters (US Gal)	Weight kg (lb)	H-arm Moment Kg.m (lb.in)	Y-arm Moment Kg.m (lb.in)
Full	6 230 (1 646)	4 891 (10 782)	318 991 (27 687 190)	0-
3/4	4 800 (1 268)	3 768 (8 307)	244 106 (21 187 469)	0
1/2	3 200 (845)	2 512 (5 538)	161 883 (14 050 849)	0
1/4	1 600 (423)	1 256 (2 769)	80 736 (7 007 546)	0

Trim Tank

TABLE 10

03-20-02 MANUAL FUEL QUANTITY INDICATION

****ON A/C A330-200 A330-300**

TASK 03-20-02-970-801-A01

Use of Magnetic Level Indicators (MLI)

1. General
   The Magnetic Level Indicators (MLI) are used on ground to calculate the fuel quantity in the wing and center tanks. The MLI located in the trim tank is solely used to confirm a trim tank empty state.
   No electrical power is required.
   See AMM 12-11-28PB301.

2. Inspections
   Not applicable.

3. Job Setup References
   - Not applicable

4. Job Set-up Information

   A. Fixtures, Tools, Test and Support Equipment

REFERENCE	DESIGNATION
98A28104000000	PURGING TOOL - WATER DRAIN

Fixtures, Tools, Test and Support Equipment

TABLE 1

   B. Referenced Information

REFERENCE	DESIGNATION
06-60-00	06-60-00-LEVELING AND LIFTING SCENARIOS
AMM 12-11-28PB301	
AMM 28-00-00PB301	
AMM 12-32-28PB301	
AMM 12-11-28-650-806	
FIGURE 03-20-02-991-002-A	FIGURE 03-20-02-991-002-A-Magnetic Level Indicators
FIGURE 03-20-02-991-004-A	FIGURE 03-20-02-991-004-A-Attitude Monitor

Referenced Information

TABLE 2

5. Procedure

   WARNING : THIS PROCEDURE IS FOR INFORMATION ONLY TO HELP YOU PREPARE THE RECOVERY OPERATION. TO DO THE PROCEDURE, YOU MUST REFER TO THE OPERATORS CUSTOMIZED DOCUMENTATION.

WARNING : MAKE SURE THAT YOU OBEY ALL THE APPLICABLE SAFETY PRECAUTIONS WHEN YOU REMOVE FUEL OR WHEN YOU WORK IN AN ENVIRONMENT WHERE THERE IS FUEL.

CAUTION : DO NOT LET THE MLI'S FALL FREELY.

CAUTION : RETRACT THE MLI'S AS SOON AS POSSIBLE. YOU CAN EASILY CAUSE DAMAGE TO AN EXTENDED MLI.

Subtask 03-20-02-869-001-A01

A. Preparation

(1) Safety Precautions

(a) You must obey the refuel/defuel safety precautions. See AMM 12-11-28PB301 and AMM 28-00-00PB301.

(b) Put the safety barriers in position.

(2) Fuel Sampling

(a) Use the 98A28104000000 PURGING TOOL - WATER DRAIN to get a fuel sample from the aircraft. See AMM 12-32-28PB301.

(b) Measure the Specific Gravity (SG) of the fuel sample.

(3) Get Access

(a) Put an access platform below the applicable MLI. See FIGURE 03-20-02-991-002-A.

(b) Open the access door 198DB, see FIGURE 03-20-02-991-004-A.

(4) Aircraft Attitude

(a) Find and write down the aircraft attitude (pitch and roll). See 06-60-00.

(b) Or, if installed, read the attitude shown by the bubble on the attitude monitor, see FIGURE 03-20-02-991-004-A.
See TABLE 3 and TABLE 4 to convert the attitude angles and grid square letters on the attitude monitor.

Pitch	Ref	Roll	Ref
-2.5°	1	-1.5°	A
-2°	2	-1.0°	B
-1.5°	3	-0.5°	C
-1.0°	4	0.0°	D
+0.5°	5	+0.5°	E
0.0°	6	+1.0°	F

Pitch	Ref	Roll	Ref
+0.5°	7	+1.5°	G

Left Wing

TABLE 3

Pitch	Ref	Roll	Ref
-2.5°	1	1.5°	G
-2°	2	1.0°	F
-1.5°	3	0.5°	E
-1.0°	4	0.0°	D
+0.5°	5	-0.5°	C
0.0°	6	-1.0°	B
+0.5°	7	-1.5°	A

Right Wing

TABLE 4

Subtask 03-20-02-970-004-A01

B. Use of the Magnetic Level Indicators (MLI)

(1) Use a screwdriver to push the applicable MLI and turn it through 90 deg.

(2) Hold and carefully lower the MLI fully. Then carefully lift the MLI until you feel the magnets engage.

(3) Read the units mark nearest to the bottom-skin of the wing and write down the number.

(4) Retract the MLI and use a screwdriver to turn it through 90 deg. to lock it.

(5) Find the volume of the fuel in each tank:

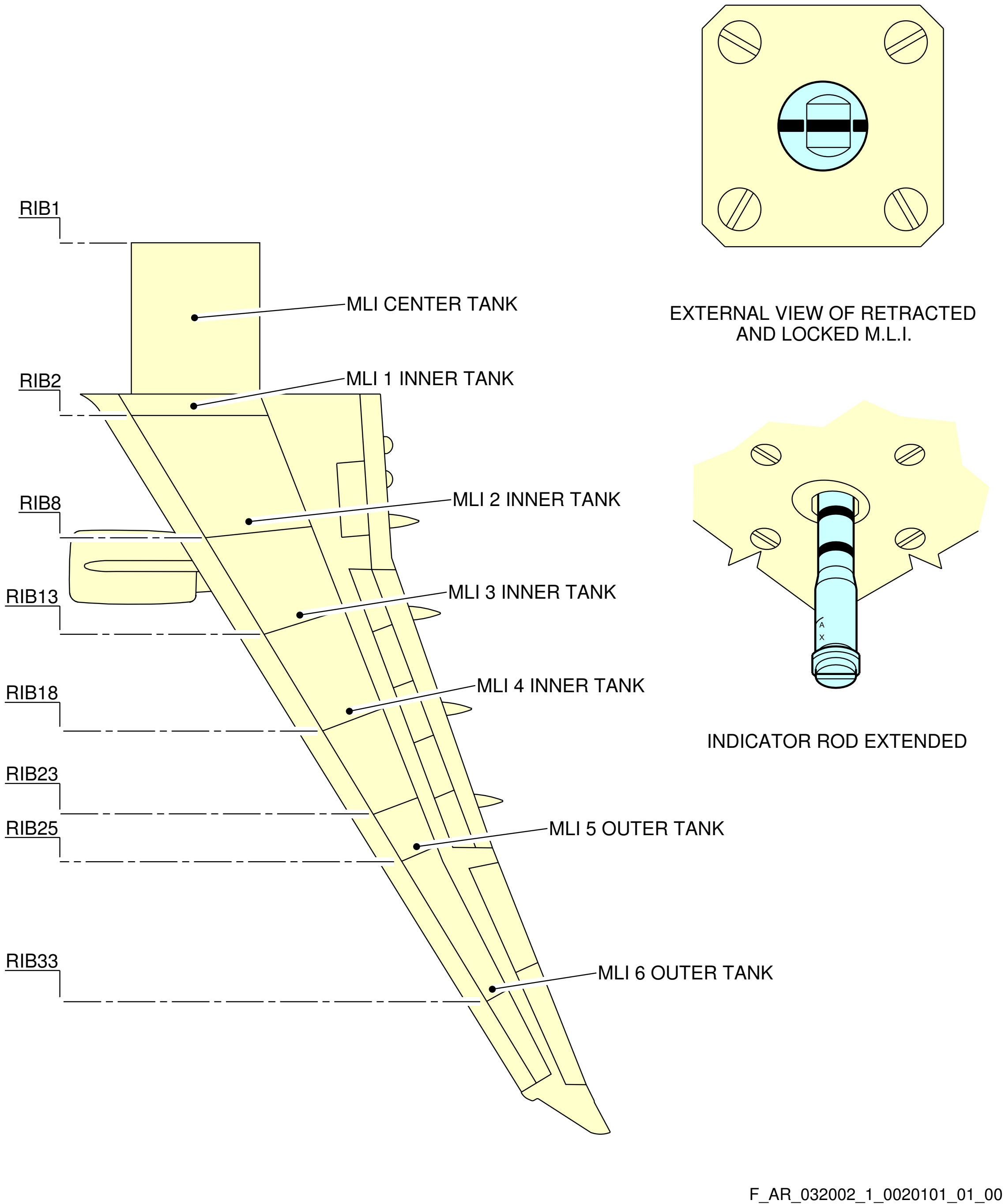
(a) Use the applicable MLI stick number and the applicable aircraft attitude grid-square letter to find the corresponding fuel quantity table. See AMM 12-11-28-650-806 for the fuel quantity tables.

(b) Find the applicable MLI unit number row and the applicable A/C attitude (grid-square letter and number) in the table.
Find the intersection of the applicable rows to give the correct volume of fuel in the tank.

(c) Multiply the total volume of the fuel by the specific gravity (SG) of the fuel to obtain the mass of the fuel.

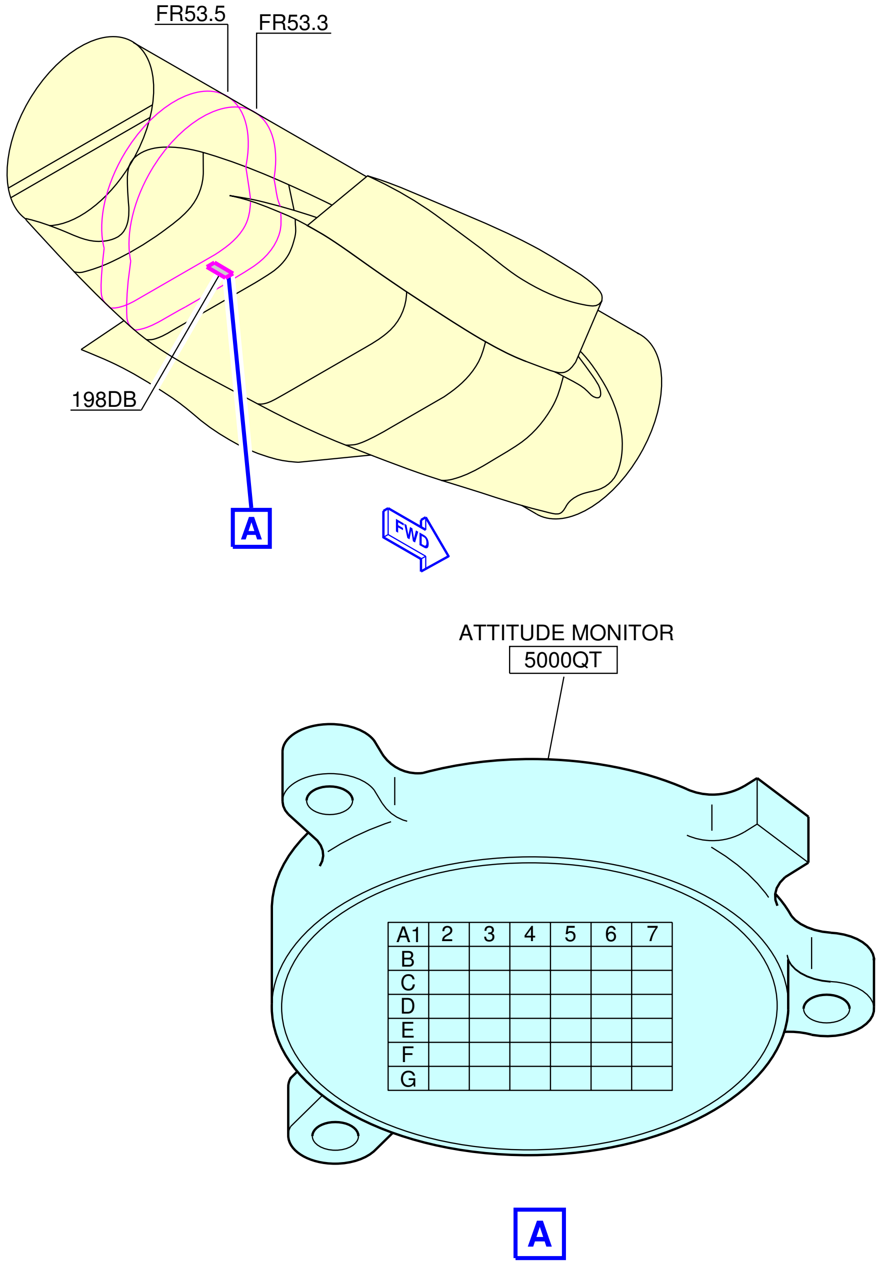
NOTE : The MLI are accurate to +/- 5 % of their indication.

**ON A/C A330-200 A330-300



Magnetic Level Indicators
Location
FIGURE-03-20-02-991-002-A01

**ON A/C A330-200 A330-300



Attitude Monitor
Location
FIGURE-03-20-02-991-004-A01

03-50 MANAGING AIRCRAFT WEIGHT AND CG

03-50-01 MANAGING AIRCRAFT WEIGHT AND CG

**ON A/C A330-200 A330-300

DESC 03-50-01-001-A01

Introduction

1. General
   Management of the aircraft weight and related CG is one of the key issues of the recovery plan and operation. It has a direct impact on aircraft stability, calculation of expected loads and the loads recorded for a given recovery process.

2. Purpose
   For a given aircraft attitude (See 06-60-00), it is necessary first to calculate the aircraft NRW and CG (See 03-00-00) to make the calculations of the expected loads, based on the leveling/lifting techniques that will be used.
   These expected loads, and then the applied loads must be in the limits that follow:
   - Aircraft allowable loads,
   - Tooling capabilities.

   If these loads are not in the limits, it will be necessary:
   - To find an alternative leveling/lifting procedure to make sure that the aircraft, tooling and equipment support loads that are not more than the allowable loads,
   - To manage aircraft weight and related CG to bring the expected loads in the allowable loads,
   - To use other tooling, if only the tool cannot support the expected loads.

   NOTE : The tooling should not only be able to support expected loads, but should also be appropriate for the travel range, arc movement, aircraft stability, ground stability, etc....

   The installation of ballast or the removal of equipment, payload, fuel, etc. can help to change the aircraft weight and CG location.
   Every effort should be made to reduce the Total Weight of the aircraft to the minimum possible by removal of significant amounts of payload. The easiest way to remove quickly large amounts of weight can be fuel and cargo removal.
   In some cases, it may be necessary to remove major aircraft components that are damaged. Before removal of these components, it is important to do a careful study because it may be better to secure them in place temporarily.
   Galley catering units (trolleys, etc.) have a significant weight and every effort should be made to remove them. If they remain on board, carefully evaluate their weight when you make the H-arm calculations.

   NOTE : Food in the catering units can deteriorate quickly. During a long recovery operation, it may become a priority to remove the catering units for health reasons.

   Draining of potable water and lavatory waste and removal of the escape slides and slide rafts can also reduce the weight.

It is not necessary to drain the fluids, such as hydraulic fluid, from closed systems unless there is significant leakage that it is not possible to contain.
As every aircraft recovery is different, it will be necessary to decide what and how much must be removed. These decisions will be based on access, time, cost and the actual ability to do the task.
The records made during the damage survey of the aircraft should include all major components that are missing or that it is necessary to remove because of damage. It is necessary to include the weight changes related to these components in the calculation of the aircraft weight and CG location.
Removal of any aircraft components and equipment should be done in accordance with the Aircraft Maintenance Manual (AMM), and recorded with the data collected during the aircraft survey.

NOTE : It is important to make sure that the aircraft is stable before and during the implementation of the recovery phase/steps.

3. Calculation Iteration
The calculation iteration from NRW and CG up to expected loads, travel range, arc movement should be continued until aircraft stability, expected loads, travel range, arc movement etc.... are in the acceptable limits.
Changes to the different inputs used in the calculations can help to get satisfactory value related to the settings of a recovery scenario.

4. List of Item Used for NRW and CG Calculation
See the related topic or task for the related item weight input.

Weight Inputs	See
OEW	03-00-00
DOW	03-00-00
Fuel Remaining on Board Effect	03-20-01
Lower Deck Cargo and Baggage Remaining Effect	DESC 03-50-01-002-A01
Ballast Added Effect	TASK 03-50-01-558-803-A01
Waste Water Remaining Effect	TASK 03-50-01-558-804-A01
Potable Water Removed Effect	TASK 03-50-01-558-806-A01
Large Component Removed /Missing Effect	TASK 03-50-01-558-810-A01
Large Component Movement Effect	TASK 03-50-01-558-811-A01

List of Item Used for NRW and CG Calculation

TABLE 1

****ON A/C A330-200 A330-300**

DESC 03-50-01-002-A01

Lower Deck Cargo and Baggage Remaining Effect

1. General

WARNING : MAKE SURE THAT ALL PERSONNEL IS AT A SAFE DISTANCE DURING THE REMOVAL OF FUEL, CARGO OR LARGE COMPONENTS. AN UNEQUAL REMOVAL OF FUEL OR CARGO OR THE REMOVAL OF LARGE COMPONENTS CAN CHANGE THE CG AND THE LONGITUDINAL AND LATERAL STABILITY OF THE AIRCRAFT. DEATH OR SERIOUS INJURY MAY RESULT IF THE AIRCRAFT FALLS ON RECOVERY PERSONNEL.

WARNING : YOU MUST MONITOR AIRCRAFT STABILITY, WEIGHT AND CG DURING THE RECOVERY PROCESS.

WARNING : IF CARGO AND BAGGAGE ARE NOT - OR CANNOT BE - REMOVED, MAKE SURE THAT THEY ARE SAFELY FASTENED AND THAT LOADS ARE AS SYMMETRICAL AS POSSIBLE BEFORE YOU START THE RECOVERY PROCESS.

The aircraft has three cargo compartments in the lower deck.

- The LD FWD Cargo Compartment in zone 130,
- The LD AFT Cargo Compartment in zone 150,
- The BULK Cargo Compartment in zone 160.

NOTE : For location see 09-10-14

NOTE : It is important to use accurate data for the calculation related to the recovery process. Some of the necessary data is the responsibility of the operator and to be accurate, it must be applicable to the specific MSN involved. Data supplied by the manufacturer as generic data is not necessarily accurate for a specific MSN. Refer to the operator's documentation for precise calculations.
If some of the necessary data is not available or if it is not possible to get it, then it is the responsibility of the recovery manager to decide to use estimated data and to continue with the process.

****ON A/C A330-200**

2. Standard Container and/or Pallet Combination Tables
The tables that follow are built with a standard combination of containers and/or pallets. If the cargo compartments contain a mixed combination, use the value given in the standard combination or in your WBM to find the applicable H-arm and Y-arm.

A. LD FWD Cargo Compartment

(1) Half Size Containers NAS3610-2K, IATA Contour E, G
See your WBM to determine applicable Y-arm.

Position ULD	Remaining Weight	H-arm	Moment to add
11L, 11R		15.433 m (607.60 in)	
12L, 12R		17.195 m (676.97 in)	
13L, 13R		18.778 m (739.29 in)	
14L, 14R		20.360 m (801.57 in)	
21L, 21R		22.123 m (870.98 in)	
22L, 22R		23.705 m (933.27 in)	
23L, 23R		25.288 m (995.59 in)	

Half Size Containers in FWD Lower Cargo Compartment Remaining Weight and Related H-arm

TABLE 1

(2) Half Size Containers NAS3610-2K, IATA Contour C, H
See your WBM to determine applicable Y-arm.

Position ULD	Remaining Weight	H-arm	Moment to add
11L or R		15.433 m (607.60 in)	
12L or R		17.195 m (676.97 in)	
13L or R		18.778 m (739.29 in)	
14L or R		20.360 m (801.57 in)	
21L or R		22.123 m (870.98 in)	
22L or R		23.705 m (933.27 in)	
23L or R		25.288 m (995.59 in)	

Half Size Containers in FWD Lower Cargo Compartment Remaining Weight and Related H-arm

TABLE 2

(3) Full Size Containers NAS3610-2L, IATA Contour F

NOTE : The Y-arm moment is negligible.

Position ULD	Remaining Weight	H-arm	Moment to add
11		15.433 m (607.60 in)	
12		17.195 m (676.97 in)	
13		18.778 m (739.29 in)	
14		20.360 m (801.57 in)	
21		22.123 m (870.98 in)	
22		23.705 m (933.27 in)	
23		25.288 m (995.59 in)	

Full Size Containers in FWD Lower Cargo Compartment Remaining Weight and Related H-arm

TABLE 3

(4) Full Size Containers NAS3610-2A2C, 2A6C, IATA Contour F

NOTE : The Y-arm moment is negligible.

Position ULD	Remaining Weight	H-arm	Moment to add
12 P		17.546 m (690.79 in)	
13 P		20.010 m (787.80 in)	
21 P		22.473 m (884.76 in)	
22 P		24.937 m (981.77 in)	

Full Size Containers in FWD Lower Cargo Compartment Remaining Weight and Related H-arm

TABLE 4

(5) Full Size Containers NAS3610-2M1C-2M3C, IATA Contour F

NOTE : The Y-arm moment is negligible.

Position ULD	Remaining Weight	H-arm	Moment to add
12 P		17.444 m (686.77 in)	
13 P		19.908 m (783.78 in)	
21 P		22.372 m (880.79 in)	
22 P		24.836 m (977.80 in)	

Full Size Containers in FWD Lower Cargo Compartment Remaining Weight and Related H-arm

TABLE 5

(6) Half Size Pallets NAS3610-2K, IATA Contour P
See your WBM to determine applicable Y-arm.

Position ULD	Remaining Weight	H-arm	Moment to add
11L, 11R		15.433 m (607.60 in)	
12L, 12R		17.195 m (676.97 in)	
13L, 13R		18.778 m (739.29 in)	
14L, 14R		20.360 m (801.57 in)	
21L, 21R		22.123 m (870.98 in)	
22L, 22R		23.705 m (933.27 in)	
23L, 23R		25.288 m (995.59 in)	

Half Size Pallets in FWD Lower Cargo Compartment Remaining Weight and Related H-arm

TABLE 6

(7) Full Size Pallets NAS3610-2L3P, 2L4P, IATA Contour F, P

NOTE : The Y-arm moment is negligible.

Position ULD	Remaining Weight	H-arm	Moment to add
11		15.433 m (607.60 in)	

Position ULD	Remaining Weight	H-arm	Moment to add
12		17.195 m (676.97 in)	
13		18.778 m (739.29 in)	
14		20.360 m (801.57 in)	
21		22.123 m (870.98 in)	
22		23.705 m (933.27 in)	
23		25.288 m (995.59 in)	

Full Size Pallets in FWD Lower Cargo Compartment Remaining Weight and Related H-arm

TABLE 7

(8) Full Size Pallets NAS3610-2A1, 2A2P, 2A3P, 2A4P, 2A6P, IATA Contour F, P

NOTE : The Y-arm moment is negligible.

Position ULD	Remaining Weight	H-arm	Moment to add
12 P		17.546 m (690.79 in)	
13 P		20.010 m (787.80 in)	
21 P		22.473 m (884.76 in)	
22 P		24.937 m (981.77 in)	

Full Size Pallets in FWD Lower Cargo Compartment Remaining Weight and Related H-arm

TABLE 8

(9) Full Size Pallets NAS3610-2M1P, 2M2P, 2M3P, IATA Contour F, P

NOTE : The Y-arm moment is negligible.

Position ULD	Remaining Weight	H-arm	Moment to add
12 P		17.444 m (686.77 in)	

Position ULD	Remaining Weight	H-arm	Moment to add
13 P		19.908 m (783.78 in)	
21 P		22.372 m (880.79 in)	
22 P		24.836 m (977.80 in)	

Full Size Pallets in FWD Lower Cargo Compartment Remaining Weight and Related H-arm

TABLE 9

B. LD AFT Cargo Compartment

(1) Half Size Containers NAS3610-2K, IATA Contour E, G
See your WBM to determine applicable Y-arm.

Position ULD	Remaining Weight	H-arm	Moment to add
31L, 31R		37.607 m (1480.59 in)	
32L, 32R		39.190 m (1542.91 in)	
33L, 33R		40.772 m (1605.20 in)	
41L, 41R		42.749 m (1683.03 in)	
42L, 42R		44.332 m (1745.35 in)	
43L, 43R		45.914 m (1807.64 in)	

Half Size Containers in Aft Lower Cargo Compartment Remaining Weight and Related H-arm

TABLE 10

(2) Half Size Containers NAS3610-2K, IATA contour C, H
See your WBM to determine applicable Y-arm.

Position ULD	Remaining Weight	H-arm	Moment to add
31L or R		37.607 m (1480.59 in)	
32L or R		39.190 m (1542.91 in)	

Position ULD	Remaining Weight	H-arm	Moment to add
33L or R		40.772 m (1605.20 in)	
41L or R		42.749 m (1683.03 in)	
42L or R		44.332 m (1745.35 in)	
43L or R		45.914 m (1807.64 in)	

Half Size Containers in Aft Lower Cargo Compartment Remaining Weight and Related H-arm

TABLE 11

(3) Full Size Containers NAS3610-2L, IATA Contour F

NOTE : The Y-arm moment is negligible.

Position ULD	Remaining Weight	H-arm	Moment to add
31		37.607 m (1480.59 in)	
32		39.190 m (1542.91 in)	
33		40.772 m (1605.20 in)	
41		42.749 m (1683.03 in)	
42		44.332 m (1745.35 in)	
43		45.914 m (1807.64 in)	

Full Size Containers in Aft Lower Cargo Compartment Remaining Weight and Related H-arm

TABLE 12

(4) Full Size Containers NAS3610-2A2C-2A6C, IATA Contour F

NOTE : The Y-arm moment is negligible.

Position ULD	Remaining Weight	H-arm	Moment to add
31 P		37.958 m (1494.41 in)	

Position ULD	Remaining Weight	H-arm	Moment to add
32 P		40.421 m (1591.38 in)	
41 P		43.100 m (1696.85 in)	
42 P		45.360 m (1785.83 in)	

Full Size Containers in Aft Lower Cargo Compartment Remaining Weight and Related H-arm

TABLE 13

(5) Full Size Containers NAS3610-2M1C-2M3C, IATA Contour F

NOTE : The Y-arm moment is negligible.

Position ULD	Remaining Weight	H-arm	Moment to add
31 P		38.059 m (1498.39 in)	
32 P		40.523 m (1595.39 in)	
41 P		42.998 m (1692.83 in)	
42 P		45.462 m (1789.84 in)	

Full Size Containers in Aft Lower Cargo Compartment Remaining Weight and Related H-arm

TABLE 14

(6) Half Size Pallets NAS3610-2K IATA Contour P
See your WBM to determine applicable Y-arm.

Position ULD	Remaining Weight	H-arm	Moment to add
31L, 31R		37.607 m (1480.59 in)	
32L, 32R		39.190 m (1542.91 in)	
33L, 33R		40.772 m (1605.20 in)	
41L, 41R		42.749 m (1683.03 in)	
42L, 42R		44.332 m (1745.35 in)	

Position ULD	Remaining Weight	H-arm	Moment to add
43L, 43R		45.914 m (1807.64 in)	

Half Size Pallets in Aft Lower Cargo Compartment Remaining Weight and Related H-arm

TABLE 15

(7) Full Size Pallets NAS3610-2L3P, 2L4P, IATA Contour F, P

NOTE : The Y-arm moment is negligible.

Position ULD	Remaining Weight	H-arm	Moment to add
31		37.607 m (1480.59 in)	
32		39.190 m (1542.91 in)	
33		40.772 m (1605.20 in)	
41		42.749 m (1683.03 in)	
42		44.332 m (1745.35 in)	
43		45.914 m (1807.64 in)	

Full Size Pallets in Aft Lower Cargo Compartment Remaining Weight and Related H-arm

TABLE 16

(8) Full Size Pallets NAS3610-2A1P, 2A2P, 2A3P, 2A4P, 2A6P IATA Contour F, P

NOTE : The Y-arm moment is negligible.

Position ULD	Remaining Weight	H-arm	Moment to add
31 P		37.958 m (1494.41 in)	
32 P		40.421 m (1591.38 in)	
41 P		43.100 m (1696.85 in)	

Position ULD	Remaining Weight	H-arm	Moment to add
42 P		45.360 m (1785.83 in)	

Full Size Pallets in Aft Lower Cargo Compartment Remaining Weight and Related H-arm

TABLE 17

(9) Full Size Pallets NAS3610-2M1P, 2M2P, 2M3P IATA Contour F, P

NOTE : The Y-arm moment is negligible.

Position ULD	Remaining Weight	H-arm	Moment to add
31 P		38.059 m (1498.39 in)	
32 P		40.523 m (1595.39 in)	
41 P		42.998 m (1692.83 in)	
42 P		45.462 m (1789.84 in)	

Full Size Pallets in Aft Lower Cargo Compartment Remaining Weight and Related H-arm

TABLE 18

C. BULK Cargo Compartment
See your WBM to determine applicable Y-arm.

Section number (Frame Station)	Remaining Weight	H-arm	Moment to add
51 (FR65A -FR67		47.427 m (1867.20 in)	
52 (FR65A - FR69)		47.957 m (1888.07 in)	
53 (FR69/69A - FR73)		50.002 m (1968.58 in)	
Total (FR65A - FR73)		49.007 m (1929.41 in)	

Lower Bulk Cargo Compartment Remaining Weight and Related H-arm

TABLE 19

D. Lower Crew Rest Compartments
Depending on the airline configuration, there can be an optional crew rest compartment installed in the forward cargo compartment or in the aft cargo compartment.
See the customized WBM for your specific aircraft configuration to find data related to the cargo crew rest compartment, if installed.

****ON A/C A330-300**

3. Standard Container and/or Pallet Combination Tables
The tables that follow are built with a standard combination of containers and/or pallets. If the cargo compartments contain a mixed combination, use the value given in the standard combination or in your WBM to find the applicable H-arm and Y-arm.

A. LD FWD Cargo Compartment

(1) Half Size Containers NAS3610-2K, IATA Contour E, G
See your WBM to determine applicable Y-arm.

Position ULD	Remaining Weight	H-arm	Moment to add
11L, 11R		15.432 m (607.56 in)	
12L, 12R		17.218 m (677.87 in)	
13L, 13R		18.801 m (740.20 in)	
21L, 21R		20.563 m (809.57 in)	
22L, 22R		22.146 m (871.89 in)	
23L, 23R		23.728 m (934.17 in)	
24L, 24R		25.491 m (1003.58 in)	
25L, 25R		27.073 m (1065.87 in)	
26L, 26R		28.655 m (1128.15 in)	

Half Size Containers in FWD Lower Cargo Compartment Remaining Weight and Related H-arm

TABLE 20

(2) Half Size Containers NAS3610-2K, IATA Contour C, H
See your WBM to determine applicable Y-arm.

Position ULD	Remaining Weight	H-arm	Moment to add
11L or R		15.432 m (607.56 in)	
12L or R		17.218 m (677.87 in)	
13L or R		18.801 m (740.20 in)	
21L or R		20.563 m (809.57 in)	
22L or R		22.146 m (871.89 in)	
23L or R		23.728 m (934.17 in)	
24L or R		25.491 m (1003.58 in)	
25L or R		27.073 m (1065.87 in)	
26L or R		28.655 m (1128.15 in)	

Half Size Containers in FWD Lower Cargo Compartment Remaining Weight and Related H-arm

TABLE 21

(3) Full Size Containers NAS3610-2L, IATA Contour F

NOTE : The Y-arm moment is negligible.

Position ULD	Remaining Weight	H-arm	Moment to add
11		15.432 m (607.56 in)	
12		17.218 m (677.87 in)	
13		18.801 m (740.20 in)	
21		20.563 m (809.57 in)	
22		22.146 m (871.89 in)	
23		23.728 m (934.17 in)	

Position ULD	Remaining Weight	H-arm	Moment to add
24		25.491 m (1003.58 in)	
25		27.073 m (1065.87 in)	
26		28.655 m (1128.15 in)	

Full Size Containers in FWD Lower Cargo Compartment Remaining Weight and Related H-arm

TABLE 22

(4) Full Size Containers NAS3610-2A2C, 2A6C, IATA Contour F

NOTE : The Y-arm moment is negligible.

Position ULD	Remaining Weight	H-arm	Moment to add
11 P		15.783 m (621.38 in)	
12 P		18.450 m (726.38 in)	
21 P		20.914 m (823.39 in)	
22 P		23.377 m (920.35 in)	
23 P		25.841 m (1017.36 in)	
24 P		28.305 m (1114.37 in)	

Full Size Containers in FWD Lower Cargo Compartment Remaining Weight and Related H-arm

TABLE 23

(5) Full Size Containers NAS3610-2M1C-2M3C, IATA Contour F

NOTE : The Y-arm moment is negligible.

Position ULD	Remaining Weight	H-arm	Moment to add
11 P		15.885 m (625.39 in)	
12 P		18.348 m (722.36 in)	

Position ULD	Remaining Weight	H-arm	Moment to add
21 P		20.812 m (819.37 in)	
22 P		23.276 m (916.38 in)	
23 P		25.740 m (1013.39 in)	
24 P		28.203 m (1110.35 in)	

Full Size Containers in FWD Lower Cargo Compartment Remaining Weight and Related H-arm

TABLE 24

(6) Half Size Pallets NAS3610-2K, IATA Contour P
See your WBM to determine applicable Y-arm.

Position ULD	Remaining Weight	H-arm	Moment to add
11L, 11R		15.432 m (607.56 in)	
12L, 12R		17.218 m (677.87 in)	
13L, 13R		18.801 m (740.20 in)	
21L, 21R		20.563 m (809.57 in)	
22L, 22R		22.146 m (871.89 in)	
23L, 23R		23.728 m (934.17 in)	
24L, 24R		25.491 m (1003.58 in)	
25L, 25R		27.073 m (1065.87 in)	
26L, 26R		28.655 m (1128.15 in)	

Half Size Pallets in FWD Lower Cargo Compartment Remaining Weight and Related H-arm

TABLE 25

(7) Full Size Pallets NAS3610-2L3P, 2L4P, IATA Contour F, P

NOTE : The Y-arm moment is negligible.

Position ULD	Remaining Weight	H-arm	Moment to add
11		15.432 m (607.56 in)	
12		17.218 m (677.87 in)	
13		18.801 m (740.20 in)	
21		20.563 m (809.57 in)	
22		22.146 m (871.89 in)	
23		23.728 m (934.17 in)	
24		25.491 m (1003.58 in)	
25		27.073 m (1065.87 in)	
26		28.655 m (1128.15 in)	

Full Size Pallets in FWD Lower Cargo Compartment Remaining Weight and Related H-arm
TABLE 26

(8) Full Size Pallets NAS3610-2A1, 2A2P, 2A3P, 2A4P, 2A6P, IATA Contour F, P

NOTE : The Y-arm moment is negligible.

Position ULD	Remaining Weight	H-arm	Moment to add
11 P		15.783 m (621.38 in)	
12 P		18.450 m (726.38 in)	
21 P		20.914 m (823.39 in)	
22 P		23.377 m (920.35 in)	
23 P		25.841 m (1017.36 in)	

Position ULD	Remaining Weight	H-arm	Moment to add
24 P		28.305 m (1114.37 in)	

Full Size Pallets in FWD Lower Cargo Compartment Remaining Weight and Related H-arm
TABLE 27

(9) Full Size Pallets NAS3610-2M1P, 2M2P, 2M3P, IATA Contour F, P

NOTE : The Y-arm moment is negligible.

Position ULD	Remaining Weight	H-arm	Moment to add
11 P		15.885 m (625.39 in)	
12 P		18.348 m (722.36 in)	
21 P		20.812 m (819.37 in)	
22 P		23.276 m (916.38 in)	
23 P		25.740 m (1013.39 in)	
24 P		28.203 m (1110.35 in)	

Full Size Pallets in FWD Lower Cargo Compartment Remaining Weight and Related H-arm
TABLE 28

B. LD AFT Cargo Compartment

(1) Half Size Containers NAS3610-2K, IATA Contour E, G
See your WBM to determine applicable Y-arm.

Position ULD	Remaining Weight	H-arm	Moment to add
31L, 31R		40.889 m (1609.80 in)	
32L, 32R		43.352 m (1706.77 in)	
33L, 33R		44.935 m (1769.09 in)	
34L, 34R		46.517 m (1831.38 in)	

Position ULD	Remaining Weight	H-arm	Moment to add
41L, 41R		48.077 m (1892.80 in)	
42L, 42R		49.659 m (1955.08 in)	
43L, 43R		51.241 m (2017.36 in)	

Half Size Containers in Aft Lower Cargo Compartment Remaining Weight and Related H-arm

TABLE 29

(2) Half Size Containers NAS3610-2K, IATA contour C, H
See your WBM to determine applicable Y-arm.

Position ULD	Remaining Weight	H-arm	Moment to add
31L or R		40.889 m (1609.80 in)	
32L or R		43.352 m (1706.77 in)	
33L or R		44.935 m (1769.09 in)	
34L or R		46.517 m (1831.38 in)	
41L or R		48.077 m (1892.80 in)	
42L or R		49.659 m (1955.08 in)	
43L or R		51.241 m (2017.36 in)	

Half Size Containers in Aft Lower Cargo Compartment Remaining Weight and Related H-arm

TABLE 30

(3) Full Size Containers NAS3610-2L, IATA Contour F

NOTE : The Y-arm moment is negligible.

Position ULD	Remaining Weight	H-arm	Moment to add
31		40.889 m (1609.80 in)	
32		43.352 m (1706.77 in)	

Position ULD	Remaining Weight	H-arm	Moment to add
33		44.935 m (1769.09 in)	
34		46.517 m (1831.38 in)	
41		48.077 m (1892.80 in)	
42		49.659 m (1955.08 in)	
43		51.241 m (2017.36 in)	

Full Size Containers in Aft Lower Cargo Compartment Remaining Weight and Related H-arm

TABLE 31

(4) Full Size Containers NAS3610-2A2C-2A6C, IATA Contour F

NOTE : The Y-arm moment is negligible.

Position ULD	Remaining Weight	H-arm	Moment to add
31 P		41.239 m (1623.58 in)	
32 P		43.703 m (1720.59 in)	
33 P		45.964 m (1809.61 in)	
41 P		48.225 m (1898.62 in)	
42 P		50.486 m (1987.64 in)	

Full Size Containers in Aft Lower Cargo Compartment Remaining Weight and Related H-arm

TABLE 32

(5) Full Size Containers NAS3610-2M1C-2M3C, IATA Contour F

NOTE : The Y-arm moment is negligible.

Position ULD	Remaining Weight	H-arm	Moment to add
31 P		41.341 m (1627.60 in)	

Position ULD	Remaining Weight	H-arm	Moment to add
32 P		43.805 m (1724.61 in)	
41 P		48.326 m (1902.60 in)	
42 P		50.789 m (1999.57 in)	

Full Size Containers in Aft Lower Cargo Compartment Remaining Weight and Related H-arm

TABLE 33

(6) Half Size Pallets NAS3610-2K3 IATA Contour P
See your WBM to determine applicable Y-arm.

Position ULD	Remaining Weight	H-arm	Moment to add
31L, 31R		40.889 m (1609.80 in)	
32L, 32R		43.352 m (1706.77 in)	
33L, 33R		44.935 m (1769.09 in)	
34L, 34R		46.517 m (1831.38 in)	
41L, 41R		48.077 m (1892.80 in)	
42L, 42R		49.659 m (1955.08 in)	
43L, 43R		51.241 m (2017.36 in)	

Half Size Pallets in Aft Lower Cargo Compartment Remaining Weight and Related H-arm

TABLE 34

(7) Full Size Pallets NAS3610-2L, IATA Contour F, P

NOTE : The Y-arm moment is negligible.

Position ULD	Remaining Weight	H-arm	Moment to add
31		40.889 m (1609.80 in)	
32		43.352 m (1706.77 in)	

Position ULD	Remaining Weight	H-arm	Moment to add
33		44.935 m (1769.09 in)	
34		46.517 m (1831.38 in)	
41		48.077 m (1892.80 in)	
42		49.659 m (1955.08 in)	
43		51.241 m (2017.36 in)	

Full Size Pallets in Aft Lower Cargo Compartment Remaining Weight and Related H-arm

TABLE 35

(8) Full Size Pallets NAS3610-2A1P, 2A2P, 2A3P, 2A4P, 2A6P IATA Contour F, P

NOTE : The Y-arm moment is negligible.

Position ULD	Remaining Weight	H-arm	Moment to add
31 P		41.239 m (1623.58 in)	
32 P		43.703 m (1720.59 in)	
33 P		45.964 m (1809.61 in)	
41 P		48.225 m (1898.62 in)	
42 P		50.486 m (1987.64 in)	

Full Size Pallets in Aft Lower Cargo Compartment Remaining Weight and Related H-arm

TABLE 36

(9) Full Size Pallets NAS3610-2M1P, 2M2P, 2M3P IATA Contour F, P

NOTE : With 96 x 125 in. ULD loaded on position 33 P, positions 32 P and 41 P have to remain unoccupied or loaded with 88 x 125 in. ULDs.

NOTE : The Y-arm moment is negligible.

Position ULD	Remaining Weight	H-arm	Moment to add
31 P		41.341 m (1627.60 in)	
32 P		43.805 m (1724.61 in)	
33 P		46.065 m (1813.58 in)	
41 P		48.326 m (1902.60 in)	
42 P		50.789 m (1999.57 in)	

Full Size Pallets in Aft Lower Cargo Compartment Remaining Weight and Related H-arm

TABLE 37

C. BULK Cargo Compartment
See your WBM to determine applicable Y-arm.

Section number (Frame Station)	Remaining Weight	H-arm	Moment to add
51 (FR65A -FR67		52.755 m (2076.97 in)	
52 (FR65A - FR69)		53.285 m . (2097.83 in)	
53 (FR69/69A - FR73)		55.330 m (2178.35 in)	
Total (FR65A - FR73)		54.335 m (2139.17 in)	

Lower Bulk Cargo Compartment Remaining Weight and Related H-arm

TABLE 38

D. Lower Crew Rest Compartments
Depending on the airline configuration, there can be an optional crew rest compartment installed in the forward cargo compartment or in the aft cargo compartment.
See the customized WBM for your specific aircraft configuration to find data related to the cargo crew rest compartment, if installed.

****ON A/C A330-200 A330-300**

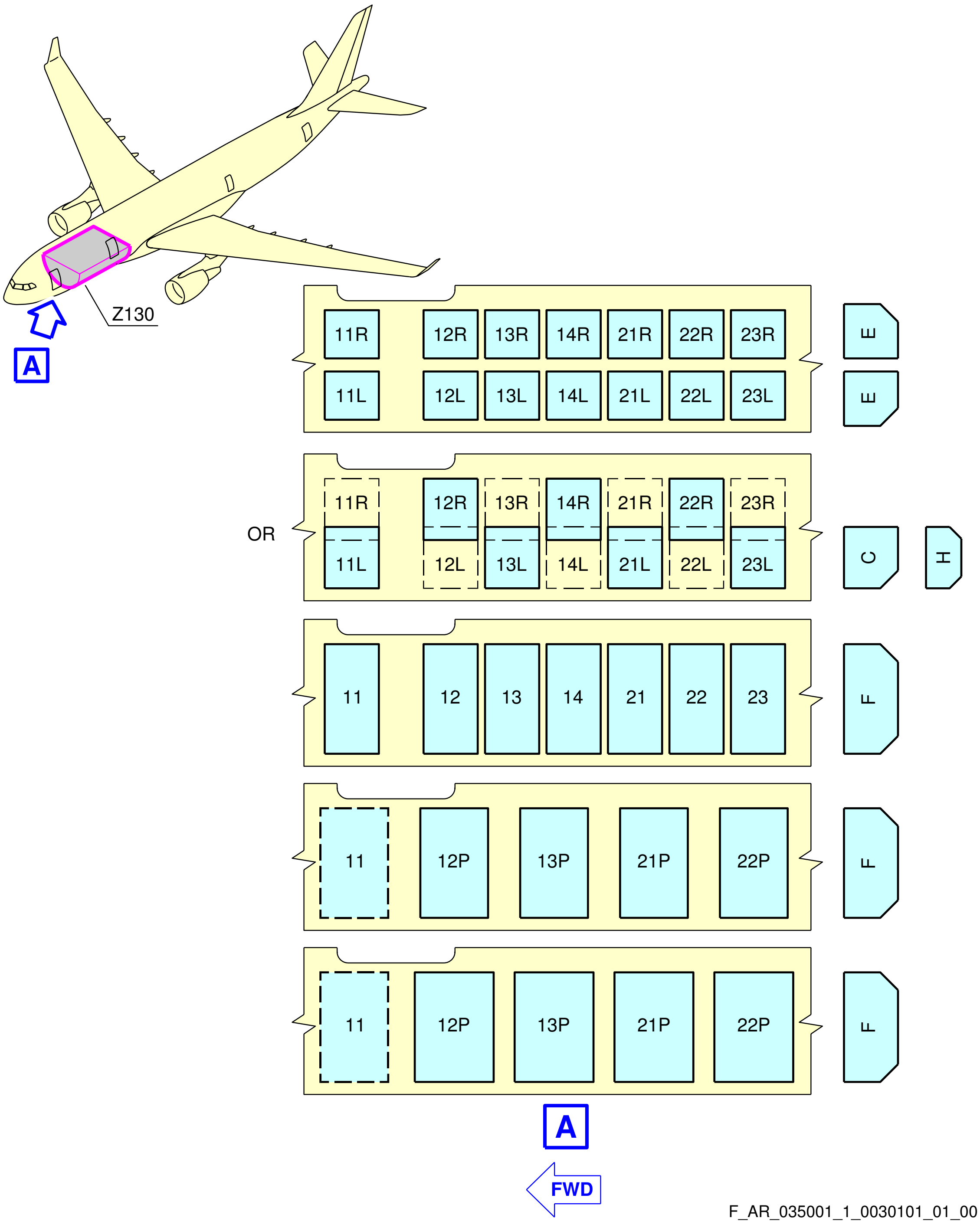
4. Determine the Effect of Cargo and Baggage Remaining on the Lower Deck

   A. Use the tables in TBD to determine H-arm moments by reporting the masses of each container or pallet.

   B. Record the calculated values on the LD FWD Cargo Compartment (in Zone 130), LD AFT Cargo Compartment (in Zone 150), BULK Cargo Compartment (in Zone 160) into boxes of the Cargo and Baggage Interim Worksheet (See, DESC 09-50-01-001-A01).

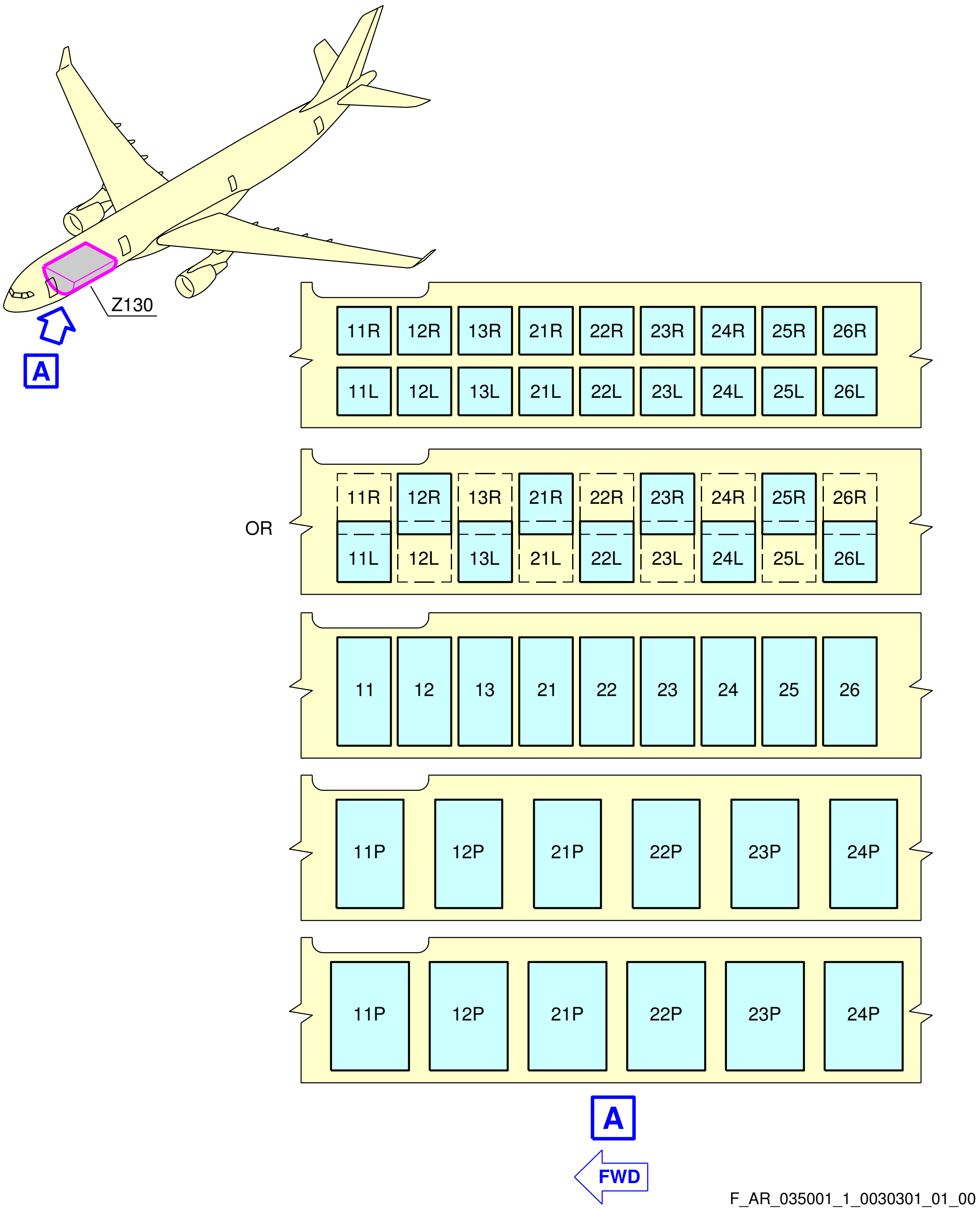
   C. Use the data related to the Cargo Crew Rest Compartment from the customized WBM and record them into the Cargo and Baggage Interim Worksheet.

**ON A/C A330-200



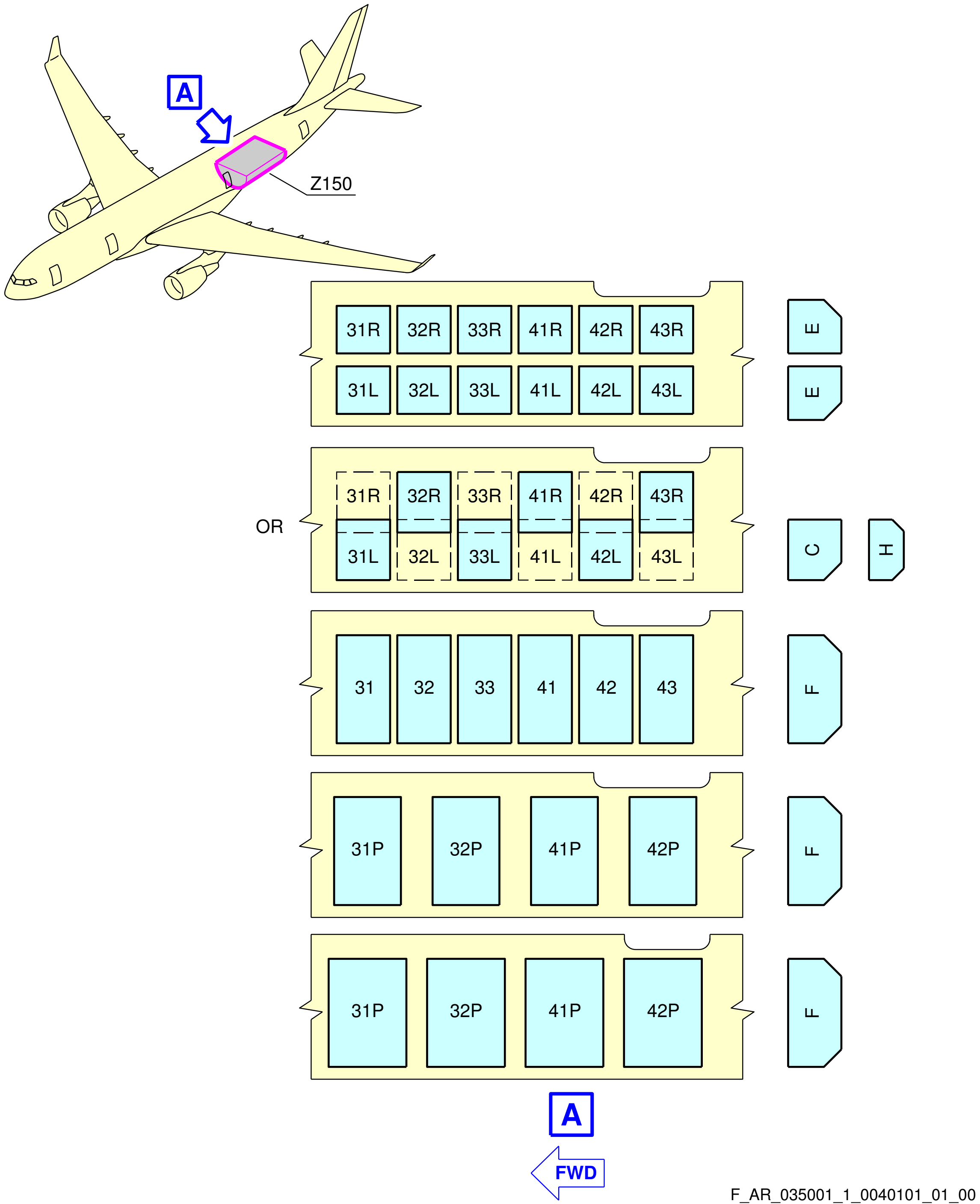
FWD Cargo Compartment Arrangements
Half Size / Full Size - Containers / Pallets
FIGURE-03-50-01-991-003-A01

**ON A/C A330-300



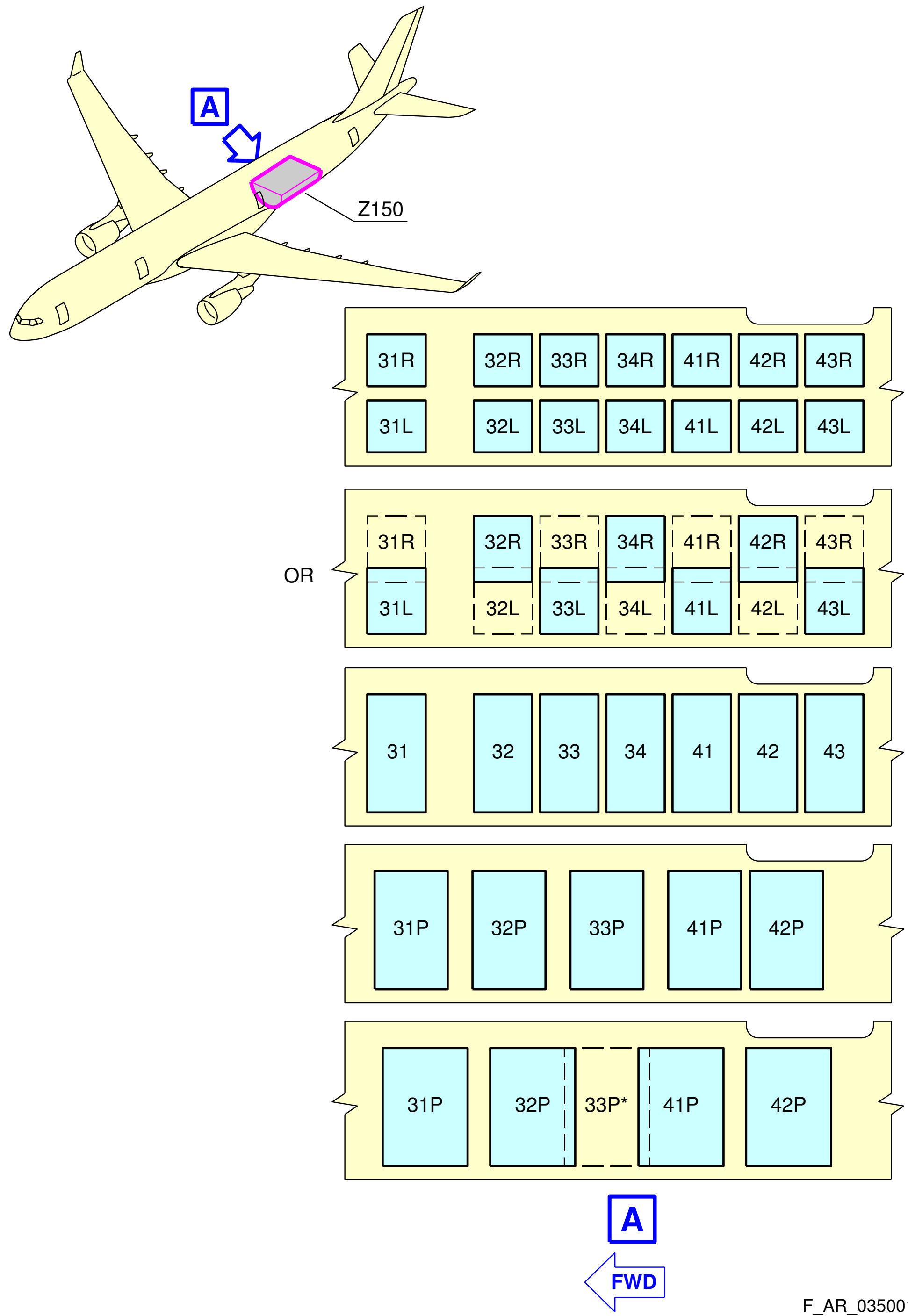
FWD Cargo Compartment Arrangements
Half Size / Full Size - Containers / Pallets
FIGURE-03-50-01-991-003-C01

**ON A/C A330-200



AFT Cargo Compartment Arrangements
Half Size / Full Size - Containers / Pallets
FIGURE-03-50-01-991-004-A01

**ON A/C A330-300



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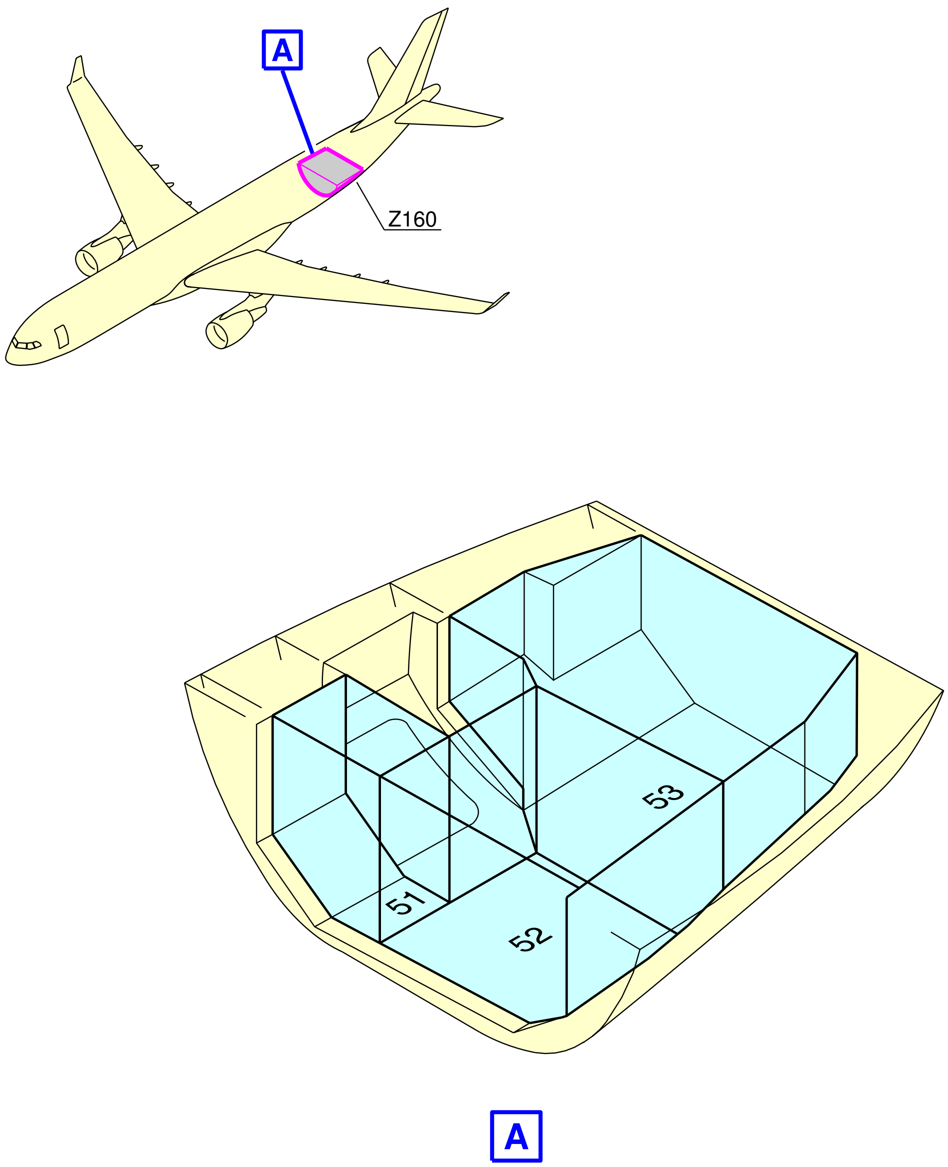
AFT Cargo Compartment Arrangements
Half Size / Full Size - Containers / Pallets
FIGURE-03-50-01-991-004-C01

**ON A/C A330-200 A330-300



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BULK Cargo Compartment
Arrangement
FIGURE-03-50-01-991-005-B01

****ON A/C A330-200 A330-300**

TASK 03-50-01-558-803-A01

Ballast Added Effect

1. General
Ballast is any heavy material that you use to add weight if you want to stabilize the aircraft with the CG change method.
Ballast can be non recovery kit stock items (such as sand bags, drums filled with water, livestock feed sacks, etc.) that you can buy in-situ. It is important that the ballast is easily transportable to the site, easily managed by the personnel on site and that, if there is a shift in the aircraft CG, no secondary damage will occur if the ballast moves inside the aircraft or when it is necessary to transport the aircraft.

2. Inspections
Not Applicable.

3. Job Setup References
Not Applicable.

4. Job Set-up Information

A. Referenced Information

REFERENCE	DESIGNATION
09-50-01	09-50-01-WEIGHT AND CG CALCULATION WORKSHEETS
09-10-06	09-10-06-FUSELAGE FRAMES AND H-ARM TABLE
09-10-08	09-10-08-WING RIBS AND STATIONS
09-10-09	09-10-09-HORIZONTAL STABILIZERS RIBS AND STATIONS

Referenced Information

TABLE 1

5. Procedure

WARNING : YOU MUST MONITOR AIRCRAFT STABILITY, WEIGHT AND CG DURING THE RECOVERY PROCESS.

NOTE : It is important to use accurate data for the calculation related to the recovery process. Some of the necessary data is the responsibility of the operator and to be accurate, it must be applicable to the specific MSN involved. Data supplied by the manufacturer as generic data is not necessarily accurate for a specific MSN. Refer to the operator's documentation for precise calculations.
If some of the necessary data is not available or if it is not possible to get it, then it is the responsibility of the recovery manager to decide to use estimated data and to continue with the process.

Subtask 03-50-01-558-003-A01

A. How to find the Effect of Added Ballast

(1) To find the effect of added ballast, you need to find the H-arm and, if applicable, the Y-arm of the zone in which you added ballast.
To calculate the necessary average H-arm and Y-arm:
- See 09-10-06 for ballast added inside of fuselage,
- See 09-10-08 for ballast added on the wing,
- See 09-10-09 for ballast added on the horizontal stabilizer.

(2) Calculate the H-arm and Y-arm moments generated by the weight of ballast you use and record them on the Ballast Added Effect Interim Worksheet (See 09-50-01).

****ON A/C A330-200 A330-300**

TASK 03-50-01-558-804-A01

Waste Water Remaining Effect

1. General
The aircraft is equipped with a vacuum system.
The waste water from the lavatories and galleys is stored in waste tanks (See DESC 09-10-12-006-A01 for tank capacities and pre-charged chemical fluid quantities).
The waste tanks are installed in the pressurized underfloor area aft of the bulk cargo compartment.
A control panel is installed in Z171.

2. Inspections
Not Applicable.

3. Job Setup References
- Not applicable

4. Job Set-up Information

A. Referenced Information

REFERENCE	DESIGNATION
DESC 09-10-12-006-A01	DESC 09-10-12-006-A01-Waste Water Disposal System
DESC 09-50-01-001-A01	DESC 09-50-01-001-A01-Worksheets

Referenced Information

TABLE 1

5. Procedure

WARNING : YOU MUST MONITOR AIRCRAFT STABILITY, WEIGHT AND CG DURING THE RECOVERY PROCESS.

NOTE : It is important to use accurate data for the calculation related to the recovery process. Some of the necessary data is the responsibility of the operator and to be accurate, it must be applicable to the specific MSN involved. Data supplied by the manufacturer as generic data is not necessarily accurate for a specific MSN. Refer to the operator's documentation for precise calculations.
If some of the necessary data is not available or if it is not possible to get it, then it is the responsibility of the recovery manager to decide to use estimated data and to continue with the process.

****ON A/C A330-200**

Subtask 03-50-01-558-004-A01

A. How to Find the Effect of Waste Water Remaining

(1) The waste water is stored in two waste tanks.

(2) To find the effect of waste water remaining, you must know the weight of the waste water remaining into tanks minus the pre-load. The generated H-arm moments must be calculated with the data given in TABLE 2.

ITEM	Remaining Weight	H-arm	Moment to add
Tank N°1		51.587 m (2030.98 in)	
Tank N°2		52.369 m (2061.77 in)	

Waste Water Remaining Weight and Relevant H-arm

TABLE 2

NOTE : The assumptions are that:
- After a flight, 2/3 of the potable water is in the waste tanks and the volume of water remaining in the potable water tank is negligible,
- At take off, the potable water tanks are full.

(3) Calculate the H-arm moments generated by the waste water and report them on the Waste Water Remaining Interim Worksheet (See DESC 09-50-01-001-A01).

****ON A/C A330-300**

Subtask 03-50-01-558-004-B01

A. How to Find the Effect of Waste Water Remaining

(1) The waste water is stored in two waste tanks.

(2) To find the effect of waste water remaining, you must know the weight of the waste water remaining into tanks minus the pre-load. The generated H-arm moments must be calculated with the data given in TABLE 3.

ITEM	Remaining Weight	H-arm	Moment to add
Tank N°1		56.914 m (2240.71 in)	
Tank N°2		57.696 m (2271.50 in)	

Waste Water Remaining Weight and Relevant H-arm

TABLE 3

NOTE : The assumptions are that:
- After a flight, 2/3 of the potable water is in the waste tanks and the volume of water remaining in the potable water tank is negligible,
- At take off, the potable water tanks are full.

(3) Calculate the H-arm moments generated by the waste water and report them on the Waste Water Remaining Interim Worksheet (See DESC 09-50-01-001-A01).

****ON A/C A330-200 A330-300**

TASK 03-50-01-558-806-A01

Potable Water Removed Effect

1. General
   The aircraft is equipped with a pressurized potable water system.
   Potable water for the toilets and galleys is stored in tanks which are installed in the pressurized underfloor area.
   See DESC 09-10-12-005-A01 for potable water tanks capacities.

   NOTE : The number of items of equipment changes with the customer.

2. Inspections
   Not Applicable.

3. Job Setup References
   - Not applicable

4. Job Set-up Information

   A. Referenced Information

REFERENCE	DESIGNATION
DESC 09-10-12-005-A01	DESC 09-10-12-005-A01-Potable Water System
DESC 09-50-01-001-A01	DESC 09-50-01-001-A01-Worksheets

Referenced Information

TABLE 1

5. Procedure

   WARNING : YOU MUST MONITOR AIRCRAFT STABILITY, WEIGHT AND CG DURING THE RECOVERY PROCESS.

   NOTE : It is important to use accurate data for the calculation related to the recovery process. Some of the necessary data is the responsibility of the operator and to be accurate, it must be applicable to the specific MSN involved. Data supplied by the manufacturer as generic data is not necessarily accurate for a specific MSN. Refer to the operator's documentation for precise calculations.
   If some of the necessary data is not available or if it is not possible to get it, then it is the responsibility of the recovery manager to decide to use estimated data and to continue with the process.

****ON A/C A330-200**

Subtask 03-50-01-558-006-A01

A. How to Find the Effect of Potable Water Removed

(1) Potable water is stored in two tanks.

(2) Weight and CG calculation is based on OEW or DOW, which include full potable water tanks.

(3) To find the effect of removed potable water, you must know the weight of the potable water which was moved to the waste tank during flight or manually removed on recovery site. The generate H-arm moments have to be calculated with data provided in TABLE 2.

Item	Remaining Weight	Average H-arm	Moment to subtract
Tank N°1		39.167 m (1542.01 in)	
Tank N°2		51.694 m (2035.20 in)	

Average H-arm, from standard aircraft configuration

TABLE 2

NOTE : The assumptions are that:
- After a flight, 2/3 of the potable water is in the waste tanks and the volume of water remaining in the potable water tanks is negligible,
- At take off, the potable water tanks are full.

(4) Calculate H-arm moments generated by the Potable Water Removed and record it on the Potable Water Removed Equipment Interim Worksheet (See DESC 09-50-01-001-A01).

****ON A/C A330-300**

Subtask 03-50-01-558-006-B01

A. How to Find the Effect of Potable Water Removed

(1) Potable water is stored in two tanks

(2) Weight and CG calculation is based on OEW or DOW, which include full potable water tanks.

(3) To find the effect of removed potable water, you must know the weight of the potable water which was moved to the waste tank during flight or manually removed on recovery site. The generate H-arm moments have to be calculated with data provided in TABLE 3.

Item	Remaining Weight	Average H-arm	Moment to subtract
Tank N°1		44.470 m (1750.79 in)	

Item	Remaining Weight	Average H-arm	Moment to subtract
Tank N°2		57.021 m (2244.92 in)	

Average H-arm, from standard aircraft configuration

TABLE 3

NOTE : The assumptions are that:
- After a flight, 2/3 of the potable water is in the waste tanks and the volume of water remaining in the potable water tanks is negligible,
- At take off, the potable water tanks are full.

(4) Calculate H-arm moments generated by the Potable Water Removed and record it on the Potable Water Removed Equipment Interim Worksheet (See DESC 09-50-01-001-A01).

****ON A/C A330-200 A330-300**

TASK 03-50-01-558-810-A01

Large Components Removed / Missing

1. General

   The equipments or aircraft parts that follow may have a significant effect on weight and balance management for the recovery.
   - APU
   - APU Exhaust
   - Pax doors
   - Cargo doors
   - Radome
   - Pylons Equipped
   - Thrust reversers
   - Engines equipped
   - Rudders
   - THS Equipped
   - Elevators
   - Slats
   - Flaps
   - Ailerons
   - Spoilers
   - Wing Tip/ Wing Tip Fence
   - Landing Gears Equipped
   - Wheels Equipped
   - Wheels
   - Tires
   - Brakes

   If you need to remove some of these large components during recovery or if some of these large components are missing when you start the recovery process, use the data that follow and calculation tables to determine the effect on NRW and the CG position.

2. Inspections

   Not Applicable.

3. Job Setup References

   Not Applicable

4. Job Set-up Information

A. Referenced Information

REFERENCE	DESIGNATION
DESC 09-50-01-001-A01	DESC 09-50-01-001-A01-Worksheets

Referenced Information

TABLE 1

5. Procedure

WARNING : MAKE SURE THAT ALL PERSONNEL IS AT A SAFE DISTANCE DURING THE REMOVAL OF FUEL, CARGO OR LARGE COMPONENTS. AN UNEQUAL REMOVAL OF FUEL OR CARGO OR THE REMOVAL OF LARGE COMPONENTS CAN CHANGE THE CG AND THE LONGITUDINAL AND LATERAL STABILITY OF THE AIRCRAFT. DEATH OR SERIOUS INJURY MAY RESULT IF THE AIRCRAFT FALLS ON RECOVERY PERSONNEL.

WARNING : YOU MUST MONITOR AIRCRAFT STABILITY, WEIGHT AND CG DURING THE RECOVERY PROCESS.

NOTE : It is important to use accurate data for the calculation related to the recovery process. Some of the necessary data is the responsibility of the operator and to be accurate, it must be applicable to the specific MSN involved. Data supplied by the manufacturer as generic data is not necessarily accurate for a specific MSN. Refer to the operator's documentation for precise calculations.
If some of the necessary data is not available or if it is not possible to get it, then it is the responsibility of the recovery manager to decide to use estimated data and to continue with the process.

**ON A/C A330-200

Subtask 03-50-01-558-014-A01

A. Equipment Tables

(1) Wing Equipment Table

Item		Weight	H-arm	H-arm Moment to Substract
Slats	N °1	155.1 kg (341.94 lb)	28.346 m (1 115.98 in)	4 396.465 kg.m (381 596.177 lb.in)
	N °2	73.9 kg (162.9 lb)	31.577 m (1 243.19 in)	2 333.540 kg.m (202 542.301 lb.in)
	N °3	63.1 kg (139.1 lb)	33.775 m (1 329.72 in)	2 131.203 kg.m (184 980.160 lb.in)
	N °4	66.4 kg (146.4 lb)	35.578 m (1 400.71 in)	2 362.379 kg.m (205 045.406 lb.in)
	N °5	58.7 kg (129.4 lb)	37.754 m (1 486.38 in)	2 216.160 kg.m (192 354.126 lb.in)
	N °6	45.6 kg (100.5 lb)	39.884 m (1 570.24 in)	1 818.710 kg.m (157 857.051 lb.in)
	N °7	38.5 kg (84.9 lb)	41.364 m (1 628.50 in)	1 592.514 kg.m (138 224.075 lb.in)
Flaps	Inner	259.1 kg (571.2 lb)	35.984 m (1 416.69 in)	9 323.454 kg.m (1809 239.895 lb.in)
	Outer	388.7 kg (856.9 lb)	38.327 m (1 508.94 in)	14 897.705 kg.m (1 293 063.347 lb.in)
Spoilers	N° 1	24.9 kg (54.9 lb)	35.152 m (1 383.94 in)	875.285 kg.m (75 971.346 lb.in)
	N° 2	23.0 kg (50.7 lb)	35.685 m (1 404.92 in)	820.755 kg.m (71 238.370 lb.in)
	N° 3	25.5 kg (56.2 lb)	36.472 m (1 435.91 in)	930.036 kg.m (80 723.539 lb.in)
	N° 4	25.5 kg (56.2 lb)	37.282 m (1 467.80 in)	950.691 kg.m (82 516.313 lb.in)
	N° 5	25.5 kg (56.2 lb)	38.122 m (1 500.87 in)	972.111 kg.m (84 375.487 lb.in)
	N° 6	22.5 kg (49.6 lb)	39.132 m (1 540.63 in)	880.470 kg.m (76 421.401 lb.in)

Item		Weight	H-arm	H-arm Moment to Substract
Ailerons	Inner	93.2 kg (205.5 lb)	40.942 m (1 611.89 in)	3 815.794 kg.m (331 196.242 lb.in)
	Outer	81.5 kg (179.7 lb)	42.677 m (1 680.20 in)	3 478.176 kg.m (301 892.223 lb.in)
Wing Tip		63.5 kg (140.0 lb)	43.512 m (1 713.07 in)	2 763.012 kg.m (239 818.789 lb.in)
Wing Tip Fence		62.0 kg (136.7 lb)	44.196 m (1 740.00 in)	2 740.152 kg.m (237 834.629 lb.in)

Wing Equipment (per Side)

TABLE 2

(2) Fuselage Equipment Table

Item		Weight	H-arm	H-arm Moment to Substract
Cabin Doors	FWD	131 kg (289 lb)	12.180 m (479.53 in)	1 595.580 kg.m (138 490.192 lb.in)
	MID	124 kg (273 lb)	20.836 m (820.31 in)	2 583.664 kg.m (224 252.074 lb.in)
Emergency Exit		68 kg (150 lb)	39.109 m (1 539.72 in)	2 659.412 kg.m (230 826.708 lb.in)
Cabin Doors	AFT	125 kg (276 lb)	51.891 m (2 042.95 in)	6 486.375 kg.m (562 992.342 lb.in)
Cargo Doors	FWD	190 kg (419 lb)	15.913 m (626.50 in)	3 023.470 kg.m (262 425.539 lb.in)
	AFT	201 kg (443 lb)	45.479 m (1 790.51 in)	9 141.279 kg.m (793 427.773 lb.in)
	BULK	34 kg (75 lb)	48.363 m (1 904.06 in)	1 644.342 kg.m (142 722.546 lb.in)
Radome		28 kg (62 lb)	7.140 m (281.10 in)	199.920 kg.m (17 352.285 lb.in)
APU Exhaust		41 kg (90 lb)	63.163 m (2 486.73 in)	2 589.683 kg.m (224 774.500 lb.in)

Item	Weight	H-arm	H-arm Moment to Substract
APU	250 kg (551 lb)	61.701 m (2 429.17 in)	15 425.250 kg.m (1 338 852.228 lb.in)

Fuselage Equipment

TABLE 3

(3) Vertical Tail Equipment Table

Item	Weight	H-arm	H-arm Moment to Substract
Box	676 kg (1 490 lb)	58.507 m (2 303.43 in)	39 550.732 kg.m (3 432 851.050 lb.in)
Rudder	335 kg (739 lb)	61.802 m (2 433.15 in)	20 703.670 kg.m (1 796 998.733 lb.in)
Removable Leading Edge	134 kg (295 lb)	57.573 m (2 266.65 in)	7 714.782 kg.m (669 613.333 lb.in)
Tip	17 kg (37 lb)	63.388 m (2 495.59 in)	1 077.596 kg.m (93 531.178 lb.in)
Fuselage Fairing	30 kg (66 lb)	53.872 m (2 120.94 in)	1 616.160 kg.m (140 276.457 lb.in)

Vertical Tail Equipment

TABLE 4

(4) Horizontal Tail Equipment Table

Item	Weight	H-arm	H-arm Moment to Substract
Box	1 220 kg (2 690 lb)	60.008 m (2 362.52 in)	73 209.760 kg.m (6 354 324.908 lb.in)
Elevator	270 kg (595 lb)	62.155 m (2 447.05 in)	16 781.850 kg.m (1 456 599.878 lb.in)
Removable Leading Edge	213 kg (470 lb)	59.337 m (2 336.10 in)	12 638.781 kg.m (1 096 997.462 lb.in)

Item	Weight	H-arm	H-arm Moment to Substract
Tip	34 kg (75 lb)	63.365 m (2 494.69 in)	2 154.410 kg.m (186 994.482 lb.in)
Tailplane Fuselage Fairing	54 kg (119 lb)	58.397 m (2 299.09 in)	3 153.438 kg.m (273 706.260 lb.in)

Horizontal Tail Equipment (per Side)

TABLE 5

(5) Pylon and Nacelle Equipment Tables

Item	Weight	H-arm	H-arm Moment to Substract	Y-arm	Y-arm Moment
Inlet Cowl	281 kg (619 lb)	25.171 m (990.98 in)	7 073.051 kg.m (613 913.557 lb.in)	-	-
Fan Cowl	159 kg (351 lb)	26.612 m (1 047.72 in)	4 231.308 kg.m (367 261.221 lb.in)	-	-
Thrust Reverser	703 kg (1 550 lb)	27.868 m (1 097.17 in)	19 591.204 kg.m (1 700 440.974 lb.in)	-	-
Core Cowl	61 kg (134 lb)	29.532 m (1 162.68 in)	1 801.452 kg.m (156 359.088 lb.in)	-	-
Primary Nozzle	79 kg (174 lb)	30.492 m (1 200.47 in)	2 408.868 kg.m (209 080.455 lb.in)	-	-
Bare Engine	5 596 kg (12 337 lb)	28.004 m (1 102.52 in)	156 710.384 kg.m (13 601 857.136 lb.in)	-	-
Complete Power Plant	6 879 kg (15 166 lb)	27.884 m (1 097.80 in)	191 814.036 kg.m (16 648 718.788 lb.in)	9.370 m (368.90 in)	64 456.230 kg.m (5 594 552.254 lb.in)

Item	Weight	H-arm	H-arm Moment to Substract	Y-arm	Y-arm Moment
Pylon	1 230 kg (2 712 lb)	29.875 m (1 176.18 in)	36 746.250 kg.m (3 189 432.825 lb.in)	-	-

GE CF6-80E1A4 - Pylon and Nacelle Equipment (per Side)

TABLE 6

Item	Weight	H-arm	H-arm Moment to Substract	Y-arm	Y-arm Moment
Inlet Cowl	227 kg (500 lb)	25.300 m (996.06 in)	5 743.100 kg.m (498 478.938 lb.in)	-	-
Fan Cowl	136 kg (300 lb)	26.655 m (1 049.41 in)	3 625.080 kg.m (314 642.968 lb.in)	-	-
Thrust Reverser	816 kg (1 799 lb)	28.250 m (1 112.20 in)	23 052.000 kg.m (2 000 824.723 lb.in)	-	-
Common Nozzle Assembly	247 kg (545 lb)	30.314 m (1 193.46 in)	7 487.558 kg.m (649 891.166 lb.in)	-	-
Bare Engine	5 286 kg (11 654 lb)	27.719 m (1 091.30 in)	146 522.634 kg.m (12 717 599.715 lb.in)	-	-
Complete Power Plant	6 712 kg (14 797 lb)	27.775 m (1 093.50 in)	186 425.800 kg.m (16 181 040.677 lb.in)	9.370 m (368.90 in)	62 891.440 kg.m (5 458 734.515 lb.in)
Pylon	1 310 kg (2 888 lb)	29.753 m (1 171.38 in)	38 976.430 kg.m (3 383 003.851 lb.in)	-	-

RR Trent 772B-60 - Pylon and Nacelle Equipment (per Side)

TABLE 7

Item	Weight	H-arm	H-arm Moment to Substract	Y-arm	Y-arm Moment
Inlet Cowl	216 kg (476 lb)	25.339 m (997.60 in)	5 473.224 kg.m (475 054.741 lb.in)	-	-
Fan Cowl	143 kg (315 lb)	26.586 m (1 046.69 in)	3 801.798 kg.m (329 981.409 lb.in)	-	-
Thrust Reverser	778 kg (1 715 lb)	27.986 m (1 101.81 in)	21 773.108 kg.m (1 889 821.828 lb.in)	-	-
Exhaust Nozzle	80 kg (176 lb)	30.272 m (1 191.81 in)	2 421.760 kg.m (210 199.431 lb.in)	-	-
Bare Engine	5 867 kg (12 935 lb)	27.785 m (1 093.90 in)	163 014.595 kg.m (14 149 038.345 lb.in)	-	-
Complete Power Plant	7 084 kg (15 618 lb)	27.737 m (1 092.01 in)	196 488.908 kg.m (17 054 479.653 lb.in)	9.370 m (368.90 in)	66 377.080 kg.m (5 761 274.628 lb.in)
Pylon	1 260 kg (2 778 lb)	29.847 m (1 175.08 in)	37 607.220 kg.m (3 264 161.702 lb.in)	-	-

PW 4168A - Pylon and Nacelle Equipment (per Side)

TABLE 8

(6) Landing Gear Equipment Tables

Item	Weight	H-arm	H-arm Moment to Substract
Landing Gear Complete	824 kg (1 816.61 lb)	12.986 m (511.26 in)	10 700.464 kg.m (928 759.020 lb.in)
Wheel with Tire	196 kg (432.11 lb)	13.054 m (513.94 in)	2 558.584 kg.m (222 075.227 lb.in)

Nose Landing Gear Equipment

TABLE 9

NOTE : Values are given for two wheels. Each equipped with a tire.

Item		Weight	H-arm	H-arm Moment to Substract	Y-arm	Y-arm Moment
Landing Gear Complete		4 167 kg (9 186.66 lb)	34.934 m (1 375.35 in)	145 569.978 kg.m (12 634 912.847 lb.in)	5.342 m (210.31 in)	22 260.114 kg.m (1 932 092.072 lb.in)
FWD Bogie	Wheel with Tire	479 kg (1 056.01 lb)	34.239 m (1 347.99 in)	16 400.481 kg.m (1 423 498.519 lb.in)	-	-
	Brake	250 kg (551.16 lb)	34.239 m (1 347.99 in)	8 559.750 kg.m (742 953.298 lb.in)	-	-
AFT Bogie	Wheel with Tire	479 kg (1 056.01 lb)	36.220 m (1 425.98 in)	17 349.380 kg.m (1 505 859.294 lb.in)	-	-
	Brake	250 kg (551.16 lb)	36.220 m (1 425.98 in)	9 055.000 kg.m (785 939.089 lb.in)	-	-

Main Landing Gear Equipment (per Side)

TABLE 10

NOTE : Values are given for two wheels. Each equipped with a tire and a brake.

****ON A/C A330-300**

Subtask 03-50-01-558-014-B01

A. Equipment Tables

(1) Wing Equipment Tables

(a) Valid for Aircraft Models (STD6 WV000-WV014)

Item		Weight	H-arm	H-arm Moment to Substract
Slats	N °1	154.7 kg (341.1 lb)	31.540 m (1 241.73 in)	4 879.238 kg.m (423 499.047 lb.in)
	N °2	73.3 kg (161.6 lb)	34.771 m (1 368.94 in)	2 548.714 kg.m (221 218.575 lb.in)
	N °3	62.4 kg (137.6 lb)	36.783 m (1 448.15 in)	2 295.259 kg.m (199 219.649 lb.in)
	N °4	65.8 kg (145.1 lb)	38.700 m (1 523.62 in)	2 546.460 kg.m (221 022.910 lb.in)
	N °5	58.4 kg (128.7 lb)	40.839 m (1 607.83 in)	2 384.939 kg.m (207 003.527 lb.in)
	N °6	45.3 kg (99.9 lb)	43.078 m (1 695.98 in)	1 951.433 kg.m (169 376.895 lb.in)
	N °7	38.3 kg (84.4 lb)	44.558 m (1 754.25 in)	1 706.571 kg.m (148 123.818 lb.in)
Flaps	Inner	262.4 kg (578.5 lb)	39.149 m (1 541.30 in)	10 272.698 kg.m (891 630.545 lb.in)
	Outer	375.9 kg (828.7 lb)	41.521 m (1 634.69 in)	15 607.744 kg.m (1 354 691.995 lb.in)
Spoilers	N° 1	24.9 kg (54.9 lb)	38.346 m (1 509.69 in)	954.815 kg.m (82 874.295 lb.in)
	N° 2	23.0 kg (50.7 lb)	38.879 m (1 530.67 in)	894.217 kg.m (77 614.588 lb.in)
	N° 3	25.5 kg (56.2 lb)	39.666 m (1 561.65 in)	1 011.483 kg.m (87 792.825 lb.in)
	N° 4	25.5 kg (56.2 lb)	40.476 m (1 593.54 in)	1 032.138 kg.m (89 585.599 lb.in)
	N° 5	25.5 kg (56.2 lb)	41.316 m (1 626.61 in)	1 053.558 kg.m (91 444.772 lb.in)
	N° 6	22.5 kg (49.6 lb)	42.326 m (1 666.38 in)	952.335 kg.m (82 659.006 lb.in)

Item		Weight	H-arm	H-arm Moment to Substract
Ailerons	Inner	93.2 kg (205.5 lb)	44.136 m (1 737.64 in)	4 060.512 kg.m (352 436.786 lb.in)
	Outer	81.5 kg (179.7 lb)	45.871 m (1 805.94 in)	3 577.938 kg.m (310 551.224 lb.in)
Wing Tip		63.5 kg (140.0 lb)	46.706 m (1 838.82 in)	2 956.490 kg.m (256 611.916 lb.in)
Wing Tip Fence		62.0 kg (136.7 lb)	47.390 m (1 865.75 in)	2 923.963 kg.m (253 788.715 lb.in)

Wing Equipment (per Side)

TABLE 11

(b) Valid for Aircraft Models (STD8 WV020-WV053)

Item		Weight	H-arm	H-arm Moment to Substract
Slats	N °1	155.1 kg (341.94 lb)	31.540 m (1 241.73 in)	4 891.854 kg.m (424 594.067 lb.in)
	N °2	73.9 kg (162.9 lb)	34.771 m (1 368.94 in)	2 569.577 kg.m (223 029.368 lb.in)
	N °3	63.1 kg (139.1 lb)	36.783 m (1 448.15 in)	2 321.007 kg.m (201 454.485 lb.in)
	N °4	66.4 kg (146.4 lb)	38.700 m (1 523.62 in)	2 569.680 kg.m (223 038.317 lb.in)
	N °5	58.7 kg (129.4 lb)	40.839 m (1 607.83 in)	2 397.191 kg.m (208 066.902 lb.in)
	N °6	45.6 kg (100.5 lb)	43.078 m (1 695.98 in)	1 964.357 kg.m (170 498.597 lb.in)
	N °7	38.5 kg (84.9 lb)	44.558 m (1 754.25 in)	1 715.483 kg.m (148 897.310 lb.in)
Flaps	Inner	259.1 kg (571.2 lb)	39.149 m (1 541.30 in)	10 143.506 kg.m (880 417.204 lb.in)
	Outer	388.7 kg (856.9 lb)	41.521 m (1 634.69 in)	16 139.213 kg.m (1 400 821.438 lb.in)

Item		Weight	H-arm	H-arm Moment to Substract
Spoilers	N° 1	24.9 kg (54.9 lb)	38.346 m (1 509.69 in)	954.815 kg.m (82 874.295 lb.in)
	N° 2	23.0 kg (50.7 lb)	38.879 m (1 530.67 in)	894.217 kg.m (77 614.588 lb.in)
	N° 3	25.5 kg (56.2 lb)	39.666 m (1 561.65 in)	1 011.483 kg.m (87 792.825 lb.in)
	N° 4	25.5 kg (56.2 lb)	40.476 m (1 593.54 in)	1 032.138 kg.m (89 585.599 lb.in)
	N° 5	25.5 kg (56.2 lb)	41.316 m (1 626.61 in)	1 053.558 kg.m (91 444.772 lb.in)
	N° 6	22.5 kg (49.6 lb)	42.326 m (1 666.38 in)	952.335 kg.m (82 659.006 lb.in)
Ailerons	Inner	93.2 kg (205.5 lb)	44.136 m (1 737.64 in)	4 113.475 kg.m (357 033.788 lb.in)
	Outer	81.5 kg (179.7 lb)	45.871 m (1 805.94 in)	3 738.487 kg.m (324 486.215 lb.in)
Wing Tip		63.5 kg (140.0 lb)	46.706 m (1 838.82 in)	2 965.831 kg.m (257 422.696 lb.in)
Wing Tip Fence		62.0 kg (136.7 lb)	47.390 m (1 865.75 in)	2 938.180 kg.m (255 022.696 lb.in)

Wing Equipment (per Side)

TABLE 12

(2) Fuselage Equipment Table

Item		Weight	H-arm	H-arm Moment to Substract
Cabin Doors	FWD	131 kg (289 lb)	12.180 m (479.53 in)	1 595.580 kg.m (138 490.192 lb.in)
	MID	124 kg (273 lb)	24.030 m (946.06 in)	2 979.720 kg.m (258 628.208 lb.in)
Emergency Exit		68 kg (150 lb)	42.303 m (1 665.47 in)	2 876.604 kg.m (249 678.136 lb.in)
Cabin Doors	AFT	125 kg (276 lb)	57.218 m (2 252.68 in)	7 152.250 kg.m (620 787.725 lb.in)

Item		Weight	H-arm	H-arm Moment to Substract
Cargo Doors	FWD	190 kg (419 lb)	15.913 m (626.50 in)	3 023.470 kg.m (262 425.539 lb.in)
	AFT	201 kg (443 lb)	50.806 m (2 000.24 in)	10 212.006 kg.m (886 362.746 lb.in)
	BULK	34 kg (75 lb)	53.690 m (2 113.78 in)	1 825.460 kg.m (158 442.890 lb.in)
Radome		28 kg (62 lb)	7.140 m (281.10 in)	199.920 kg.m (17 352.285 lb.in)
APU Exhaust		41 kg (90 lb)	68.490 m (2 696.46 in)	2 808.090 kg.m (243 731.385 lb.in)
APU		250 kg (551 lb)	67.028 m (2 638.90 in)	16 757.000 kg.m (1 454 442.994 lb.in)

Fuselage Equipment

TABLE 13

(3) Vertical Tail Equipment Tables

(a) Valid for Aircraft Models (STD6 WV000-WV014)

Item	Weight	H-arm	H-arm Moment to Substract
Box	519 kg (1 144 lb)	64.010 m (2 520.08 in)	33 221.190 kg.m (2 883 471.208 lb.in)
Rudder	183 kg (403 lb)	66.897 m (2 633.74 in)	12 242.151 kg.m (1 062 571.507 lb.in)
Removable Leading Edge	114 kg (251 lb)	63.351 m (2 494.13 in)	7 222.014 kg.m (626 842.971 lb.in)
Tip	12 kg (26 lb)	67.921 m (2 674.06 in)	815.052 kg.m (70 743.371 lb.in)
Fuselage Fairing	32 kg (71 lb)	60.752 m (2 391.81 in)	1 944.064 kg.m (168 737.260 lb.in)

Vertical Tail Equipment

TABLE 14

(b) Valid for Aircraft Models (STD8 WV020-WV053)

Item	Weight	H-arm	H-arm Moment to Substract
Box	604 kg (1 332 lb)	63.629 m (2 505.08 in)	38 431.916 kg.m (3 335 742.135 lb.in)
Rudder	241 kg (531 lb)	66.764 m (2 628.50 in)	16 090.124 kg.m (1 396 560.728 lb.in)
Removable Leading Edge	132 kg (291 lb)	62.745 m (2 470.28 in)	8 282.340 kg.m (718 875.180 lb.in)
Tip	12 kg (26 lb)	67.930 m (2 674.41 in)	815.160 kg.m (70 752.745 lb.in)
Fuselage Fairing	32 kg (71 lb)	58.538 m (2 304.65 in)	1 873.216 kg.m (162 587.927 lb.in)

Vertical Tail Equipment

TABLE 15

(4) Horizontal Tail Equipment Tables

(a) Valid for Aircraft Models (STD6 WV000-WV014)

Item	Weight	H-arm	H-arm Moment to Substract
Box	1337 kg (2 948 lb)	65.335 m (2 572.24 in)	87 352.895 kg.m (7 581 894.498 lb.in)
Elevator	270 kg (595 lb)	67.482 m (2 656.77 in)	18 220.140 kg.m (1 581 437.904 lb.in)
Removable Leading Edge	182 kg (401 lb)	64.664 m (2 545.83 in)	11 768.848 kg.m (1 021 490.632 lb.in)
Tip	34 kg (75 lb)	68.692 m (2 704.41 in)	2 335.528 kg.m (202 714.826 lb.in)
Tailplane Fuselage Fairing	54 kg (119 lb)	63.724 m (2 508.82 in)	3 441.096 kg.m (298 673.866 lb.in)

Horizontal Tail Equipment (per Side)

TABLE 16

(b) Valid for Aircraft Models (STD8 WV020-WV053)

Item	Weight	H-arm	H-arm Moment to Substract
Box	1 220 kg (2 690 lb)	65.287 m (2 570.35 in)	79 650.140 kg.m (6 913 325.062 lb.in)
Elevator	270 kg (595 lb)	67.482 m (2 656.77 in)	18 220.140 kg.m (1 581 437.904 lb.in)
Removable Leading Edge	213 kg (470 lb)	64.589 m (2 542.87 in)	13 757.457 kg.m (1 194 094.226 lb.in)
Tip	34 kg (75 lb)	68.692 m (2 704.41 in)	2 335.528 kg.m (202 714.826 lb.in)
Tailplane Fuselage Fairing	54 kg (119 lb)	63.724 m (2 508.82 in)	3 441.096 kg.m (298 673.866 lb.in)

Horizontal Tail Equipment (per Side)

TABLE 17

(5) Power Plant and Pylon Equipment Tables

(a) Valid for Aircraft Models (STD6 WV000-WV014)

Item	Weight	H-arm	H-arm Moment to Substract	Y-arm	Y-arm Moment
Inlet Cowl	281 kg (619 lb)	28.365 m (1 116.73 in)	7 970.565 kg.m (691 814.312 lb.in)	-	-
Fan Cowl	159 kg (351 lb)	29.806 m (1 173.46 in)	4 739.154 kg.m (411 340.295 lb.in)	-	-
Thrust Reverser	703 kg (1 550 lb)	31.062 m (1 222.91 in)	21 836.586 kg.m (1 895 331.474 lb.in)	-	-
Core Cowl	61 kg (134 lb)	32.726 m (1 288.43 in)	1 996.286 kg.m (173 269.928 lb.in)	-	-
Primary Nozzle	79 kg (174 lb)	33.686 m (1 326.22 in)	2 661.194 kg.m (230 981.379 lb.in)	-	-

Item	Weight	H-arm	H-arm Moment to Substract	Y-arm	Y-arm Moment
Bare Engine	5 596 kg (12 337 lb)	31.198 m (1 228.27 in)	174 584.008 kg.m (15 153 218.787 lb.in)	-	-
Complete Power Plant	6 879 kg (15 166 lb)	31.078 m (1 223.54 in)	213 785.562 kg.m (18 555 762.533 lb.in)	9.370 m (368.90 in)	64 456.230 kg.m (5 594 552.254 lb.in)
Pylon	1 230 kg (2 712 lb)	33.069 m (1 301.93 in)	40 674.870 kg.m (3 530 421.894 lb.in)	-	-

GE CF6-80E1A2 - Pylon and Nacelle Equipment (per Side)

TABLE 18

Item	Weight	H-arm	H-arm Moment to Substract	Y-arm	Y-arm Moment
Inlet Cowl	227 kg (500 lb)	28.494 m (1 121.81 in)	6 468.138 kg.m (561 409.441 lb.in)	-	-
Fan Cowl	136 kg (300 lb)	29.849 m (1 175.16 in)	4 059.464 kg.m (352 345.824 lb.in)	-	-
Thrust Reverser	816 kg (1 799 lb)	31.444 m (1 237.95 in)	25 658.304 kg.m (2 227 041.862 lb.in)	-	-
Common Nozzle Assembly	247 kg (545 lb)	33.508 m (1 319.21 in)	8 276.476 kg.m (718 366.207 lb.in)	-	-
Bare Engine	5 286 kg (11 654 lb)	30.913 m (1 217.05 in)	163 406.118 kg.m (14 183 021.032 lb.in)	-	-
Complete Power Plant	6 712 kg (14 797 lb)	30.970 m (1 219.29 in)	207 870.640 kg.m (18 042 370.109 lb.in)	9.370 m (368.90 in)	62 891.440 kg.m (5 458 734.515 lb.in)

Item	Weight	H-arm	H-arm Moment to Substract	Y-arm	Y-arm Moment
Pylon	1 310 kg (2 888 lb)	32.947 m (1 297.13 in)	43 160.570 kg.m (3 746 171.071 lb.in)	-	-

RR Trent 768-60 - Pylon and Nacelle Equipment (per Side)

TABLE 19

Item	Weight	H-arm	H-arm Moment to Substract	Y-arm	Y-arm Moment
Inlet Cowl	216 kg (476 lb)	28.533 m (1 123.35 in)	6 163.128 kg.m (534 935.749 lb.in)	-	-
Fan Cowl	143 kg (315 lb)	29.780 m (1 172.44 in)	4 258.540 kg.m (369 624.853 lb.in)	-	-
Thrust Reverser	778 kg (1 715 lb)	31.180 m (1 227.56 in)	24 258.040 kg.m (2 105 504.345 lb.in)	-	-
Exhaust Nozzle	80 kg (176 lb)	33.466 m (1 317.56 in)	2 677.280 kg.m (232 377.582 lb.in)	-	-
Bare Engine	5 867 kg (12 935 lb)	30.979 m (1 219.65 in)	181 753.793 kg.m (15 775 528.482 lb.in)	-	-
Complete Power Plant	7 084 kg (15 618 lb)	30.931 m (1 217.76 in)	219 115.204 kg.m (19 018 354.911 lb.in)	9.370 m (368.90 in)	66 377.080 kg.m (5 761 274.628 lb.in)
Pylon	1 260 kg (2 778 lb)	33.041 m (1 300.83 in)	41 631.660 kg.m (3 613 467.578 lb.in)	-	-

PW 4164/4168 - Pylon and Nacelle Equipment (per Side)

TABLE 20

(b) Valid for Aircraft Models (STD8 WV020-WV053)

Item	Weight	H-arm	H-arm Moment to Substract	Y-arm	Y-arm Moment
Inlet Cowl	281 kg (619 lb)	28.365 m (1 116.73 in)	7 970.565 kg.m (691 814.312 lb.in)	-	-
Fan Cowl	159 kg (351 lb)	29.806 m (1 173.46 in)	4 739.154 kg.m (411 340.295 lb.in)	-	-
Thrust Reverser	703 kg (1 550 lb)	31.062 m (1 222.91 in)	21 836.586 kg.m (1 895 331.474 lb.in)	-	-
Core Cowl	61 kg (134 lb)	32.726 m (1 288.43 in)	1 996.286 kg.m (173 269.928 lb.in)	-	-
Primary Nozzle	79 kg (174 lb)	33.686 m (1 326.22 in)	2 661.194 kg.m (230 981.379 lb.in)	-	-
Bare Engine	5 596 kg (12 337 lb)	31.198 m (1 228.27 in)	174 584.008 kg.m (15 153 218.787 lb.in)	-	-
Complete Power Plant	6 879 kg (15 166 lb)	31.078 m (1 223.54 in)	213 785.562 kg.m (18 555 762.533 lb.in)	9.370 m (368.90 in)	64 456.230 kg.m (5 594 552.254 lb.in)
Pylon	1 230 kg (2 712 lb)	33.069 m (1 301.93 in)	40 674.870 kg.m (3 530 421.894 lb.in)	-	-

GE CF6-80E1A4 - Pylon and Nacelle Equipment (per Side)

TABLE 21

Item	Weight	H-arm	H-arm Moment to Substract	Y-arm	Y-arm Moment
Inlet Cowl	227 kg (500 lb)	28.494 m (1 121.81 in)	6 468.138 kg.m (561 409.441 lb.in)	-	-

Item	Weight	H-arm	H-arm Moment to Substract	Y-arm	Y-arm Moment
Fan Cowl	136 kg (300 lb)	29.849 m (1 175.16 in)	4 059.464 kg.m (352 345.824 lb.in)	-	-
Thrust Reverser	816 kg (1 799 lb)	31.444 m (1 237.95 in)	25 658.304 kg.m (2 227 041.862 lb.in)	-	-
Common Nozzle Assembly	247 kg (545 lb)	33.508 m (1 319.21 in)	8 276.476 kg.m (718 366.207 lb.in)	-	-
Bare Engine	5 286 kg (11 654 lb)	30.913 m (1 217.05 in)	163 406.118 kg.m (14 183 021.032 lb.in)	-	-
Complete Power Plant	6 712 kg (14 797 lb)	30.970 m (1 219.29 in)	207 870.640 kg.m (18 042 370.109 lb.in)	9.370 m (368.90 in)	62 891.440 kg.m (5 458 734.515 lb.in)
Pylon	1 310 kg (2 888 lb)	32.947 m (1 297.13 in)	43 160.570 kg.m (3 746 171.071 lb.in)	-	-

RR Trent 772B-60 - Pylon and Nacelle Equipment (per Side)

TABLE 22

Item	Weight	H-arm	H-arm Moment to Substract	Y-arm	Y-arm Moment
Inlet Cowl	216 kg (476 lb)	28.533 m (1 123.35 in)	6 163.128 kg.m (534 935.749 lb.in)	-	-
Fan Cowl	143 kg (315 lb)	29.780 m (1 172.44 in)	4 258.540 kg.m (369 624.853 lb.in)	-	-
Thrust Reverser	778 kg (1 715 lb)	31.180 m (1 227.56 in)	24 258.040 kg.m (2 105 504.345 lb.in)	-	-

Item	Weight	H-arm	H-arm Moment to Substract	Y-arm	Y-arm Moment
Exhaust Nozzle	80 kg (176 lb)	33.466 m (1 317.56 in)	2 677.280 kg.m (232 377.582 lb.in)	-	-
Bare Engine	5 867 kg (12 935 lb)	30.979 m (1 219.65 in)	181 753.793 kg.m (15 775 528.482 lb.in)	-	-
Complete Power Plant	7 084 kg (15 618 lb)	30.931 m (1 217.76 in)	219 115.204 kg.m (19 018 354.911 lb.in)	9.370 m (368.90 in)	66 377.080 kg.m (5 761 274.628 lb.in)
Pylon	1 260 kg (2 778 lb)	33.041 m (1 300.83 in)	41 631.660 kg.m (3 613 467.578 lb.in)	-	-

PW 4168A - Pylon and Nacelle Equipment (per Side)

TABLE 23

(6) Landing Gear Equipment Tables

(a) Valid for Aircraft Models (STD6 WV000-WV014)

Item	Weight	H-arm	H-arm Moment to Substract
Landing Gear Complete	759 kg (1 673 lb)	12.986 m (511.26 in)	9 856.374 kg.m (855 495.262 lb.in)
Wheel with Tire	194 kg (428 lb)	13.054 m (513.94 in)	2 532.476 kg.m (219 809.153 lb.in)

Nose Landing Gear Equipment

TABLE 24

NOTE : Values are given for two wheels. Each equipped with a tire.

Item	Weight	H-arm	H-arm Moment to Substract	Y-arm	Y-arm Moment
Landing Gear Complete	3 934 kg (8 673 lb)	38.133 m (1 501.30 in)	150 015.222 kg.m (13 020 742.887 lb.in)	5.342 m (210.31 in)	21 015.428 kg.m (1 824 058.126 lb.in)

Item		Weight	H-arm	H-arm Moment to Substract	Y-arm	Y-arm Moment
FWD Bogie	Wheel with Tire	451 kg (994 lb)	37.433 m (1 473.74 in)	16 882.283 kg.m (1 465 317.075 lb.in)	-	-
	Brake	257 kg (567 lb)	37.433 m (1 473.74 in)	9 620.281 kg.m (835 003.300 lb.in)	-	-
AFT Bogie	Wheel with Tire	451 kg (994 lb)	39.415 m (1 551.77 in)	17 776.165 kg.m (1 542 902.586 lb.in)	-	-
	Brake	257 kg (567 lb)	39.415 m (1 551.77 in)	10 129.655 kg.m (879 214.999 lb.in)	-	-

Main Landing Gear Equipment (per Side)

TABLE 25

NOTE : Values are given for two wheels. Each equipped with a tire and a brake.

(b) Valid for Aircraft Models (STD8 WV020-WV053)

Item	Weight	H-arm	H-arm Moment to Substract
Landing Gear Complete	824 kg (1 816.61 lb)	12.986 m (511.26 in)	10 700.464 kg.m (928 759.020 lb.in)
Wheel with Tire	196 kg (432.11 lb)	13.054 m (513.94 in)	2 558.584 kg.m (222 075.227 lb.in)

Nose Landing Gear Equipment

TABLE 26

NOTE : Values are given for two wheels. Each equipped with a tire.

Item	Weight	H-arm	H-arm Moment to Substract	Y-arm	Y-arm Moment
Landing Gear Complete	4 167 kg (9 186.66 lb)	38.128 m (1 501.10 in)	158 879.376 kg.m (13 790 117.279 lb.in)	5.342 m (210.31 in)	22 260.114 kg.m (1 932 092.072 lb.in)

Item		Weight	H-arm	H-arm Moment to Substract	Y-arm	Y-arm Moment
FWD Bogie	Wheel with Tire	479 kg (1 056.01 lb)	37.433 m (1 473.74 in)	17 930.407 kg.m (1 556 290.197 lb.in)	-	-
	Brake	250 kg (551.16 lb)	37.433 m (1 473.74 in)	9 358.250 kg.m (812 260.019 lb.in)	-	-
AFT Bogie	Wheel with Tire	479 kg (1 056.01 lb)	39.414 m (1 551.73 in)	18 879.306 kg.m (1 638 650.972 lb.in)	-	-
	Brake	250 kg (551.16 lb)	39.414 m (1 551.73 in)	9 853.500 kg.m (855 245.810 lb.in)	-	-

Main Landing Gear Equipment (per Side)

TABLE 27

NOTE : Values are given for two wheels. Each equipped with a tire and a brake.

****ON A/C A330-200 A330-300**

Subtask 03-50-01-558-010-A01

B. How to find the Effect of Large Components Removed / Missing

(1) See the above tables to determine the weight, H-arm and Y-arm Moment.

(2) Record Weight, H-arm and Y-arm Moment into the relevant boxes of the Large Component Removed / Missing Effect Interim Worksheet (See DESC 09-50-01-001-A01).

****ON A/C A330-200 A330-300**

TASK 03-50-01-558-811-A01

Large Components Movement Effect

1. General
   The CG positions of the OEW or the DOW apply to specific aircraft conditions which include the landing gear extended and the flaps and slats retracted.

   NOTE : The thrust reverser extension effect is negligible on the A/C CG.

2. Inspections
   Not Applicable.

3. Job Setup References
   Not Applicable.

4. Job Set-up Information

   A. Referenced Information

REFERENCE	DESIGNATION
DESC 09-50-01-001-A01	DESC 09-50-01-001-A01-Worksheets

Referenced Information

TABLE 1

5. Procedure

   WARNING : MAKE SURE THAT THE LANDING GEAR AND DOOR TRAVEL RANGES ARE CLEAR. MOVEMENT OF THE LANDING GEAR AND DOORS CAN CAUSE INJURY AND/OR DAMAGE.

   WARNING : YOU MUST MONITOR AIRCRAFT STABILITY, WEIGHT AND CG DURING THE RECOVERY PROCESS.

   NOTE : It is important to use accurate data for the calculation related to the recovery process. Some of the necessary data is the responsibility of the operator and to be accurate, it must be applicable to the specific MSN involved. Data supplied by the manufacturer as generic data is not necessarily accurate for a specific MSN. Refer to the operator's documentation for precise calculations.
   If some of the necessary data is not available or if it is not possible to get it, then it is the responsibility of the recovery manager to decide to use estimated data and to continue with the process.

****ON A/C A330-200**

Subtask 03-50-01-558-021-A01

A. How to Find the Effect of Large Component Movement

(1) To find the effect of large component movement, you must know the moments (generated by H-arm) depending of Aircraft Landing Gear retraction, Slats and Flaps extension.

(2) To know this, see Tables below and record the H-arm moment on the Large Component Movement Effect Interim Worksheet (See DESC 09-50-01-001-A01).

(3) Landing Gear Retraction

Landing Gear Retraction	H-arm Moment to Subtract
NLG	1 018 kg.m (88 358 lb.in)
MLG	5 659 kg.m (491 179 lb.in)

L/G Retraction Effect

TABLE 2

(4) Slats and Flaps Extension Effect

Cockpit Indication (Degrees)		H-arm Moment		
SLATS Inboard/Outboard	FLAPS	SLATS	FLAPS	TOTAL
14/16	0	-498 kg.m (-43 224 lb.in)	0 kg.m (0 lb.in)	-498 kg.m (-43 224 lb.in)
14/16	8	-498 kg.m (-43 224 lb.in)	823 kg.m (71 433 lb.in)	325 kg.m (28 209 lb.in)
17.7/20	14	-638 kg.m (-55 376 lb.in)	966 kg.m (83 845 lb.in)	328 kg.m (28 469 lb.in)
19.6/23	22	-719 kg.m (62 406 lb.in)	1 087 kg.m (94 347 lb.in)	368 kg.m (31 941 lb.in)
19.6/23	23	-719 kg.m (62 406 lb.in)	1 195 kg.m (103 721 lb.in)	476 kg.m (41 315 lb.in)

Slats and Flaps Extension Effect

TABLE 3

**ON A/C A330-300

Subtask 03-50-01-558-021-B01

A. How to Find the Effect of Large Component Movement

(1) To find the effect of large component movement, you must know the moments (generated by H-arm) depending of Aircraft Landing Gear retraction, Slats and Flaps extension.

(2) To know this, see Tables below and record the H-arm moment on the Large Component Movement Effect Interim Worksheet (See DESC 09-50-01-001-A01).

(3) Landing Gear Retraction

(a) Valid for Aircraft Models STD6 (WV000-014)

Landing Gear Retraction	H-arm Moment to Subtract
NLG	941 kg.m (81 675 lb.in)
MLG	5 232 kg.m (454 117 lb.in)

L/G Retraction Effect

TABLE 4

(b) Valid for Aircraft Models STD8 (WV020-053)

Landing Gear Retraction	H-arm Moment to Subtract
NLG	1 018 kg.m (88 358 lb.in)
MLG	5 659 kg.m (491 179 lb.in)

L/G Retraction Effect

TABLE 5

(4) Slats and Flaps Extension Effect

(a) Valid for Aircraft Models STD6 (WV000-014)

Cockpit Indication (Degrees)		H-arm Moment		
SLATS Inboard/Outboard	FLAPS	SLATS	FLAPS	TOTAL
14/16	0	-498 kg.m (-43 224 lb.in)	0 kg.m (0 lb.in)	-498 kg.m (-43 224 lb.in)
14/16	8	-498 kg.m (-43 224 lb.in)	823 kg.m (71 433 lb.in)	325 kg.m (28 209 lb.in)

Cockpit Indication (Degrees)		H-arm Moment		
17.7/20	14	-638 kg.m (-55 376 lb.in)	966 kg.m (83 845 lb.in)	328 kg.m (28 469 lb.in)
19.6/23	22	-719 kg.m (62 406 lb.in)	1 087 kg.m (94 347 lb.in)	368 kg.m (31 941 lb.in)
19.6/23	23	-719 kg.m (62 406 lb.in)	1 195 kg.m (103 721 lb.in)	476 kg.m (41 315 lb.in)

Slats and Flaps Extension Effect

TABLE 6

(b) Valid for Aircraft Models STD8 (WV020-053)

Cockpit Indication (Degrees)		H-arm Moment		
SLATS Inboard/Outboard	FLAPS	SLATS	FLAPS	TOTAL
14/16	0	-498 kg.m (-43 224 lb.in)	0 kg.m (0 lb.in)	-498 kg.m (-43 224 lb.in)
14/16	8	-498 kg.m (-43 224 lb.in)	823 kg.m (71 433 lb.in)	325 kg.m (28 209 lb.in)
17.7/20	14	-638 kg.m (-55 376 lb.in)	966 kg.m (83 845 lb.in)	328 kg.m (28 469 lb.in)
19.6/23	22	-719 kg.m (62 406 lb.in)	1 087 kg.m (94 347 lb.in)	368 kg.m (31 941 lb.in)
19.6/23	23	-719 kg.m (62 406 lb.in)	1 195 kg.m (103 721 lb.in)	476 kg.m (41 315 lb.in)

Slats and Flaps Extension Effect

TABLE 7

03-60 REFERENCE FOR CALCULATION

03-60-01 REFERENCE FOR CALCULATION

****ON A/C A330-200 A330-300**

DESC 03-60-01-001-A01

Information Required and Source Data

1. General

CAUTION : THE NRW AND CG LOCATION CAN ONLY BE AS ACCURATE AS THE DATA USED TO CALCULATE THEM. IF ACCURATE DATA IS NOT AVAILABLE OR IF THE DATA USED ARE EXTRAPOLATIONS, THIS WILL HAVE AN EFFECT ON THE RESULTS THAT YOU GET.

This section gives the details on definitions related to CG management, and the source of the required data. It also tells you how to use these data to calculate the NRW and CG location.
In most cases, several sources exist to find the required data.
Accurate calculations require specific data based on the specific aircraft MSN and actual airline load and trim sheet information.
In case of a serious aircraft accident and subsequent freeze of the aircraft documentation, generic aircraft type data can be used. This can also apply if it is impossible to power the onboard computers.

NOTE : Contact telephone numbers for the load and weight and balance office should be readily available.

****ON A/C A330-200**

2. Where to find the data

CAUTION : IF YOU USE THE OEW GENERIC DATA TO CALCULATE THE NRW, THE CG POSITION AND THE EXPECTED LOADS, THE RESULTS YOU GET WILL NOT BE ACCURATE.

A. OEW (Operating Empty Weight) and associated H-arm:
It is possible to take the data from these sources:
- Airline Load and Trim Sheet,
- Onboard Computers,
- Weight and Balance Manual,
- The generic OEW with an associated CG at 25%RC is about 116740 kg (257367 lb) with GE CF6-80 engines, 117041 kg (258031 lb) with PW 4000 engines or 116840 kg (257588 lb) with RR TRENT 700 engines.

NOTE : The OEW and the associated H-arm are given for a specific aircraft configuration: all landing gears extended flight controls retracted and thrust reversers in stored position.

B. Remaining Fuel

(1) There are three possibilities for the remaining fuel in the Trim Tank :
- Event occurred at take-off: FUEL IN TRIM TANK POSSIBLE,
- Event occurred after a normal flight: NO FUEL IN TRIM TANK,
- Event occurred after an emergency descent: FUEL IN TRIM TANK POSSIBLE.

(2) The means of extracting data can be used:
- Use data from the total fuel weight from load and trim sheet,
- Use data from MCDU,
- Do the measurements from magnetic fuel indicators or do an estimation based on fuel load of 1/4, 1/2, 3/4 (See 03-20-01and 03-20-02),
- Do an estimation of the remaining fuel weight from the trim load sheet based on the operator's known fuel consumption.

(3) Find the associated H-arm and Y-arm. These values depend on the distribution of the fuel load. See 03-20-02 to asses the fuel quantity (magnetic fuel indicators, MCDU, or specific method), and associated H-arm and Y-arm.

C. Cargo Payload
- Use the total cargo payload weight from the load and trim sheet,
- H-arm and Y-arm: the operator should give the H-arm and Y-arm associated to cargo compartments,
- H-arm and Y-arm: extract generic data from the Weight and Balance Manual,
- Calculate H-arm and Y-arm, see 03-50-01,
- Do approximate weight and position estimations based on observation,
- Ask for assistance of airline load office.

D. Weight and H-arm of any Missing or Removed Large Components
- Take the weight of the removed units,
- Use weights and moments listed in chapter 03-50-01,
- Use details from the Weight and Balance Manual.

E. Weight of Fluids either Removed or On Board
- Use data from the Weight and Balance Manual,
- H-arm calculated in chapter 03-50-01.

F. Change of the moment with landing gear retracted or leading edge and trailing edge surfaces extended
- See 03-50-01.

**ON A/C A330-300

3. Where to find the data

CAUTION : IF YOU USE THE OEW GENERIC DATA TO CALCULATE THE NRW, THE CG POSITION AND THE EXPECTED LOADS, THE RESULTS YOU GET WILL NOT BE ACCURATE.

A. OEW (Operating Empty Weight) and associated H-arm:
It is possible to take the data from these sources:
- Airline Load and Trim Sheet,
- Onboard Computers,
- Weight and Balance Manual,
- The generic OEW with an associated CG at 25%RC is about 119831 kg (264182 lb) with GE CF6-80 engines, 120132 kg (264846 lb) with PW 4000 engines or 119931 kg (264402 lb) with RR TRENT 700 engines.

NOTE : The OEW and the associated H-arm are given for a specific aircraft configuration: all landing gears extended flight controls retracted and thrust reversers in stored position.

B. Remaining Fuel

(1) There are three possibilities for the remaining fuel in the Trim Tank :
- Event occurred at take-off: FUEL IN TRIM TANK POSSIBLE,
- Event occurred after a normal flight: NO FUEL IN TRIM TANK,
- Event occurred after an emergency descent: FUEL IN TRIM TANK POSSIBLE.

(2) The means of extracting data can be used:
- Use data from the total fuel weight from load and trim sheet,
- Use data from MCDU,
- Do the measurements from magnetic fuel indicators or do an estimation based on fuel load of 1/4, 1/2, 3/4 (See 03-20-01and 03-20-02),
- Do an estimation of the remaining fuel weight from the trim load sheet based on the operator's known fuel consumption.

(3) Find the associated H-arm and Y-arm. These values depend on the distribution of the fuel load. See 03-20-02 to asses the fuel quantity (magnetic fuel indicators, MCDU, or specific method), and associated H-arm and Y-arm.

C. Cargo Payload
- Use the total cargo payload weight from the load and trim sheet,
- H-arm and Y-arm: the operator should give the H-arm and Y-arm associated to cargo compartments,
- H-arm and Y-arm: extract generic data from the Weight and Balance Manual,
- Calculate H-arm and Y-arm, see 03-50-01,
- Do approximate weight and position estimations based on observation,
- Ask for assistance of airline load office.

D. Weight and H-arm of any Missing or Removed Large Components
- Take the weight of the removed units,
- Use weights and moments listed in chapter 03-50-01,
- Use details from the Weight and Balance Manual.

E. Weight of Fluids either Removed or On Board
- Use data from the Weight and Balance Manual,
- H-arm calculated in chapter 03-50-01.

F. Change of the moment with landing gear retracted or leading edge and trailing edge surfaces extended
- See 03-50-01.

PREPARATION

04-00 PREPARATION

04-00-00 PREPARATION

****ON A/C A330-200 A330-300**

DESC 04-00-00-001-A01

General

1. Tethering
   It is generally agreed that the aircraft must be tethered during recovery leveling and lifting operations. However, it is necessary to evaluate carefully the benefit and purpose.
   A. During leveling or lifting, make sure that the aircraft is stable, and prevent uncontrolled movement of the aircraft.
      This movement can be caused by:
      - Change of CG position during aircraft lifting/leveling,
      - Weather conditions,
      - Terrain conditions change: humidity, temperature, soil capability.
   B. These conditions will help you decide whether to tether the aircraft or not:
      - Aircraft attitude,
      - Leveling/lifting procedure used,
      - Terrain conditions,
      - Wind/weather condition,
      - Increase of aircraft stability foreseen.
      It is necessary to do an evaluation of the tethering loads. They must be in the aircraft allowable limits. During the tethering operation, it is necessary to continuously monitor these loads.
2. Shoring
   Shoring of the aircraft can also be necessary to make it stable prior to remove fuel or cargo payload or to allow a change/repositioning of the recovery tooling.
   For the shoring operation, it is possible to use large timbers to support or stabilize the forward or aft fuselage and/or the lower wing surfaces. These supports must be placed in the correct load bearing areas and be adequately padded to prevent damage.
   For example, it is possible to make fuselage supports or cradles to match the contours of the fuselage frames. Adequate padding can consist of heavy felt, rubber sheets, rubber tires, mattresses or sand bags.
   The same conditions as above will help you decide whether to shore the aircraft or not.
   The shoring loads must be evaluated, be in the aircraft allowable limits and monitored. All applied loads for allowable skin pressure and fuselage bending moment calculations must also be in the ARM limits.

3. Lifting and Tethering Material
See 09-30-01.

04-20 STABILIZING THE AIRCRAFT

04-20-00 STABILIZING THE AIRCRAFT

****ON A/C A330-200 A330-300**

TASK 04-20-00-588-801-A01

Stabilizing the Aircraft

1. General
   The operations that follow are necessary to stabilize the aircraft.
2. Inspections
   Not Applicable.
3. Job Setup References
   Not Applicable.
4. Job Set-up Information
   A. Referenced Information

REFERENCE	DESIGNATION
TASK 02-30-01-200-801-A01	TASK 02-30-01-200-801-A01-Landing Gear Survey
03-50-01	03-50-01-MANAGING AIRCRAFT WEIGHT AND CG
04-30-00	04-30-00-TETHERING THE AIRCRAFT
05-30-00	05-30-00-MOVING FUEL FOR CG CONTROL
04-80-00	04-80-00-MANUAL OPERATION OF SYSTEMS
FIGURE 04-20-00-991-001-A	FIGURE 04-20-00-991-001-A-Aircraft Stability
FIGURE 04-20-00-991-001-B	FIGURE 04-20-00-991-001-B-Aircraft Stability

Referenced Information

TABLE 1

5. Procedure

   Subtask 04-20-00-588-001-A01

   A. General
      (1) Make sure that maximum weight has been removed to make the aircraft as light as possible.
      (2) Calculate the NRW and CG position, see 03-50-01.
      (3) You must also make sure that the wind speed is not more than the maximum allowable speed, see FIGURE 04-20-00-991-001-AFIGURE 04-20-00-991-001-B.

(4) Monitor visually the ground contact point of the A/C (either L/G or jack) to detect any movement or attitude change during the leveling and lifting operation. If load cells are available on recovery jacks, monitor load indication shift.
The monitoring of the vertical position of the shock absorber in the strut with a reference line can be also an indicator of A/C stability.

(5) Select the method that you will use to control the CG during the leveling/lifting operation by addition or removal of ballast and transfer of fuel.

(6) Make sure the aircraft is correctly grounded.

(7) Install landing gear downlock pins in all landing gears that are extended, see TASK 02-30-01-200-801-A01.

(8) Install tethers as soon as possible if the aircraft is unstable and moves in the wind, see 04-30-00.

(9) Install temporary shoring timbers in relation with the tethers to help stabilize the aircraft when necessary.

(10) Transfer fuel from the low wing to the opposite wing to move weight and leveling/lifting load from the low wing, see 05-30-00.
It is also possible to use this procedure to reduce the loads on an engine resting on the ground.

(11) The shock absorber of the low wing landing gear can be inflated while the shock absorber of the landing gear on the high wing can be deflated to help raise a low wing.

(12) It is possible to operate the spoilers in strong wind conditions to help stabilize the aircraft, see 04-80-00.

(13) Put the horizontal stabilizer to a slightly nose down position.

NOTE : You can do this only if power is available on the aircraft.

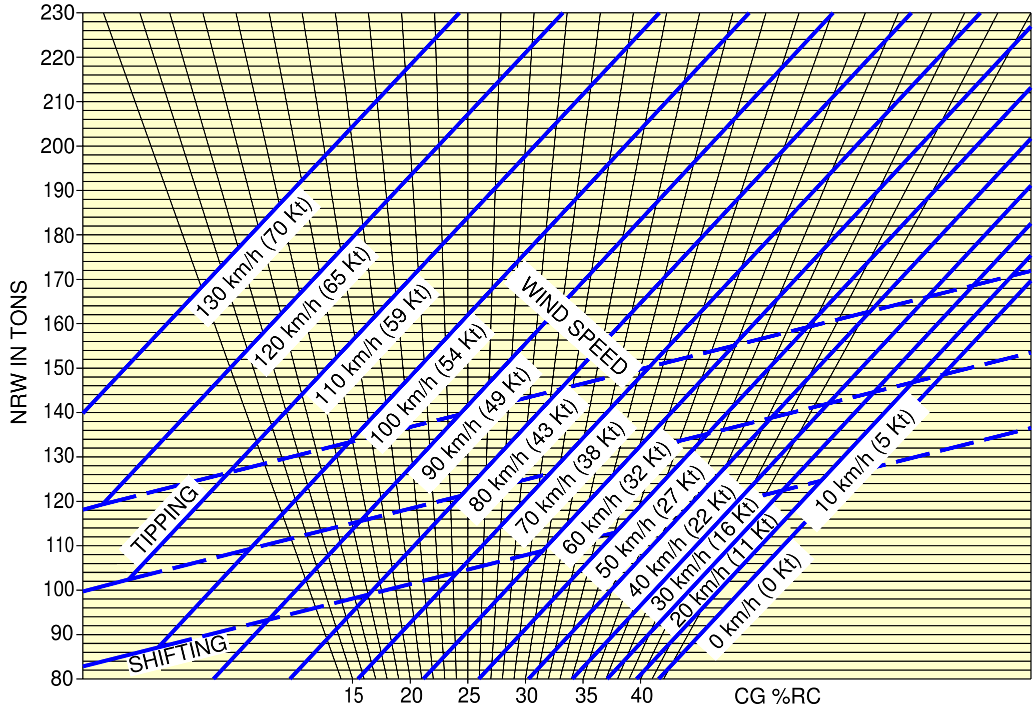
(14) Stabilize the soil around the aircraft so that cargo loading equipment and fuel tankers can come near to the aircraft.

(15) Make sure that the aircraft CG position stays at least 500 mm (20 in) forward the aircraft balance point (which is the aircraft support point: the main landing gear or the wing main jacks).

NOTE : Other operations may be necessary depending on the specific recovery conditions.

(16) To determine the aircraft stability refer to FIGURE 04-20-00-991-001-AFIGURE 04-20-00-991-001-B.

**ON A/C A330-200



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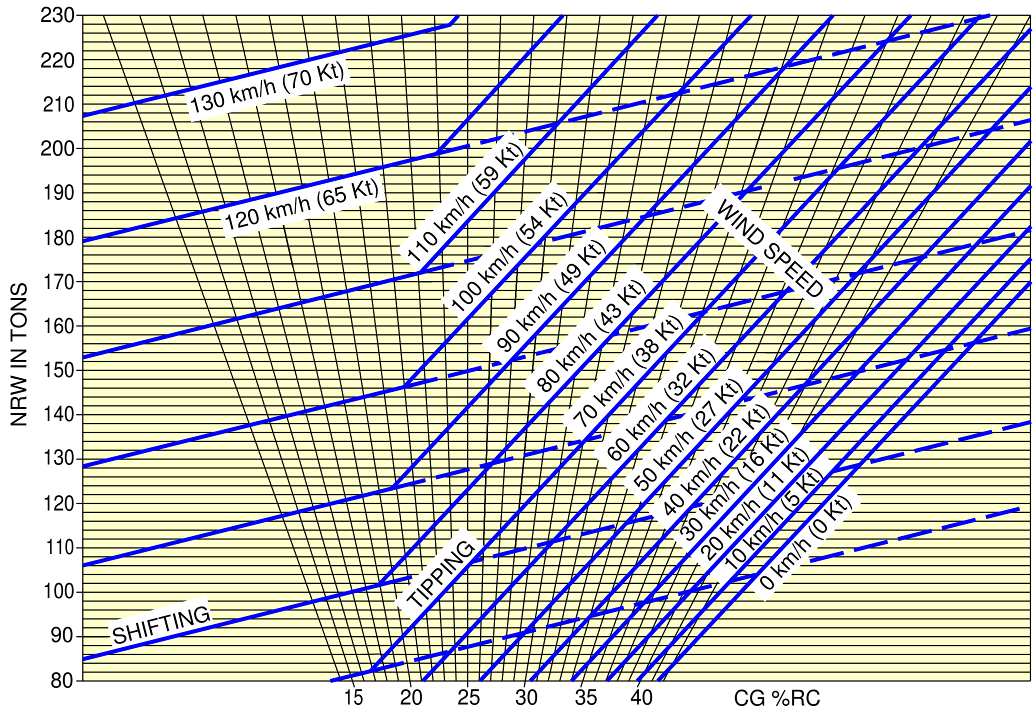
Aircraft Stability
Wheels on Dry Ground (Sheet 1 of 2)
FIGURE-04-20-00-991-001-A01

**ON A/C A330-200



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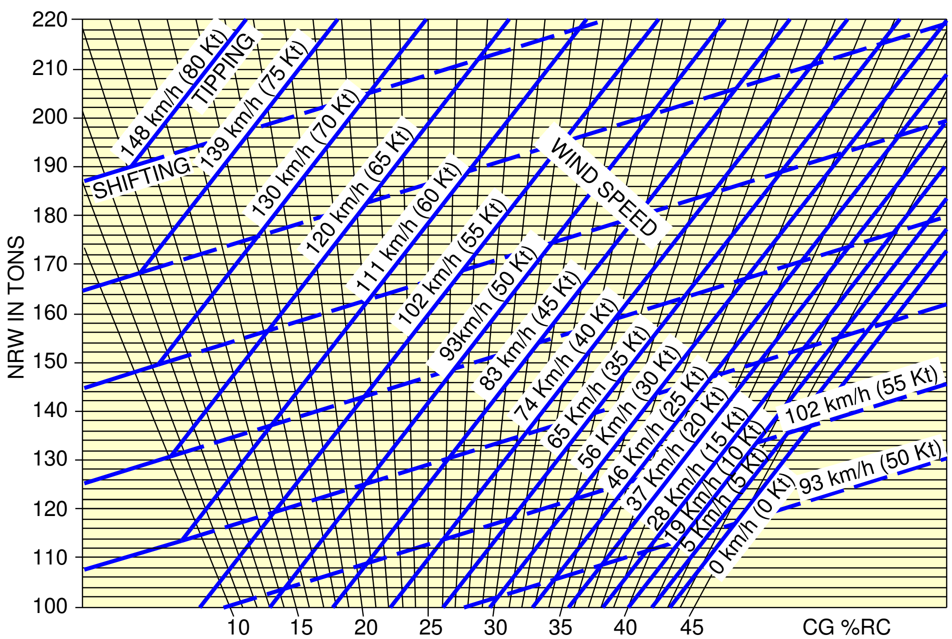
Aircraft Stability
Wheels on Wet Ground (Sheet 2 of 2)
FIGURE-04-20-00-991-001-A01

**ON A/C A330-300



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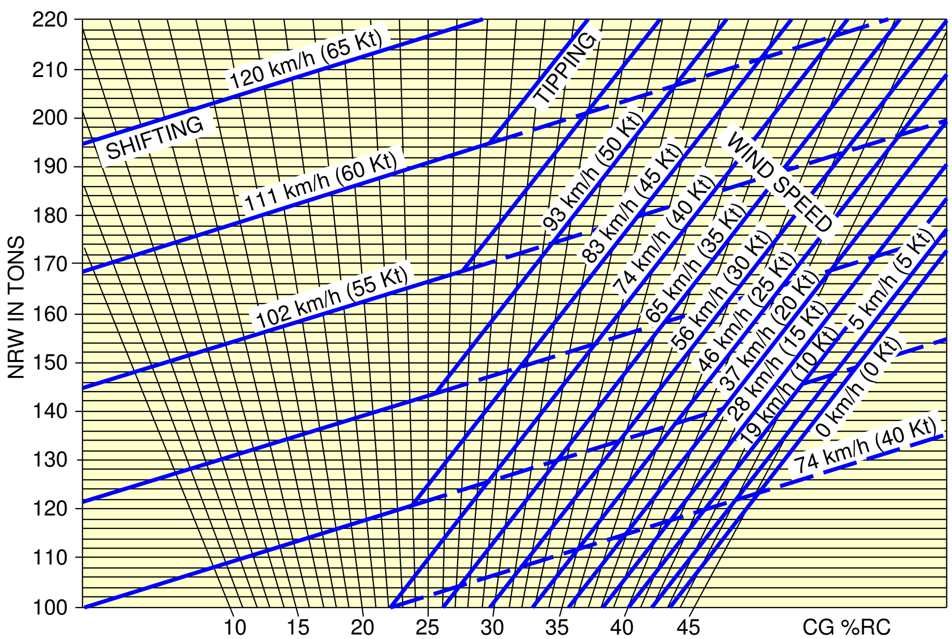
Aircraft Stability
Wheels on Dry Ground (Sheet 1 of 2)
FIGURE-04-20-00-991-001-B01

**ON A/C A330-300



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Aircraft Stability
Wheels on Wet Ground (Sheet 2 of 2)
FIGURE-04-20-00-991-001-B01

04-30 TETHERING THE AIRCRAFT

04-30-00 TETHERING THE AIRCRAFT

****ON A/C A330-200 A330-300**

DESC 04-30-00-001-A01

General

1. Tethering the aircraft

   CAUTION : YOU MUST NOT USE THE SAME FITTING TO TETHER THE AIRCRAFT AND TO LIFT IT AT THE SAME TIME.IF YOU USE THE SAME FITTING, THERE IS A RISK THAT THE LOADS APPLIED WILL BE MORE THAN THE ALLOWABLE LOADS. THIS CAN CAUSE DAMAGE TO THE STRUCTURE.

   CAUTION : DURING THE LEVELING AND LIFTING PROCESS, YOU MUST MONITOR AND ADJUST THE TENSIONING DEVICES TO MAKE SURE THAT THE LOADS APPLIED ARE NOT MORE THAN THE MAXIMUM LOADS.

   NOTE : The information or principle contained in this chapter are given as a guide to assist an aircraft recovery.

   During the lifting operations of a damaged aircraft with cranes, jacks and/or pneumatic lifting bags, you should tether the aircraft to prevent horizontal movement due to lifting side force (weight of the aircraft, wind force, etc.).
   You can attach the tether to fabric straps installed around the fuselage or the engine pylons or to different fittings such as pylon hoist fittings, fuselage fittings and vertical stabilizer fittings.
   To make sure that the horizontal stability is satisfactory, it is necessary to safely attach the aircraft tethering cables to heavy vehicles or to a deadman tightly attached to the ground. The tethers should make different angles with the fuselage centerline to prevent aircraft movement in all the directions.
   A tensioning device should be provided for each tethering line so that tension is satisfactory at each tether during the lifting operation.
   The number of tethers changes with the type of recovery operation and is related to the strength and direction of the wind.
   See FIGURE 04-30-00-991-001-A for wind loads applied on the aircraft on ground.

2. Tethering Using the Mooring Fittings
   Mooring fittings can be installed on the fuselage. See FIGURE 04-30-00-991-002-A for the location of the Mooring fittings.
   At each position, remove the blanking screws and the remaining sealant before you install the mooring fitting.

Tethering Position	Fitting P/N
FR 17 LH	
PRE MOD 48082S30507	98F07203000 MOORING FITTING - 132
POST MOD 48082S30507	98F07203000 MOORING FITTING - 150
FR 17 RH	
PRE MOD 48082S30507	98F07203000 MOORING FITTING - 133
POST MOD 48082S30507	98F07203000 MOORING FITTING - 151
FR 36 LH	98F07203000 MOORING FITTING - 134
FR 36 RH	98F07203000 MOORING FITTING - 135
FR 59 LH	98F07203000 MOORING FITTING - 140
FR 59 RH	98F07203000 MOORING FITTING - 141
FR 76 LH	98F07203000 MOORING FITTING - 142
FR 76 RH	98F07203000 MOORING FITTING - 143

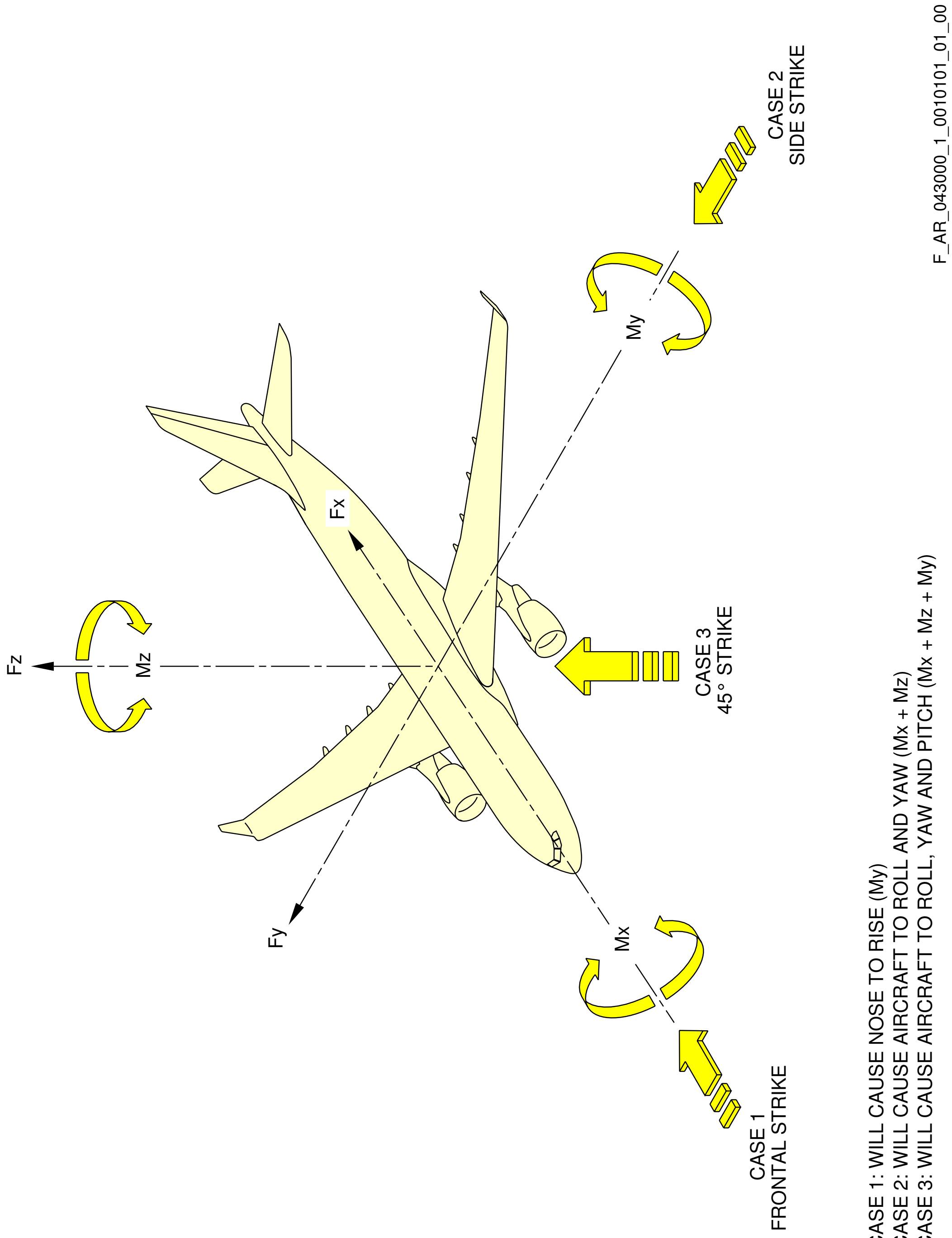
Mooring Fitting Positions

TABLE 1

3. Tethering Using Straps or Cables
   You can install straps or cables around the engine pylons and the fuselage main frames: FR15, FR36, FR59 and FR76.
   You must install a protection (plywood sheet covered with thick padding) between these straps or cables and the fuselage and engine pylons. You can attach the tethers, tightly connected to the ground, to these straps or cables.

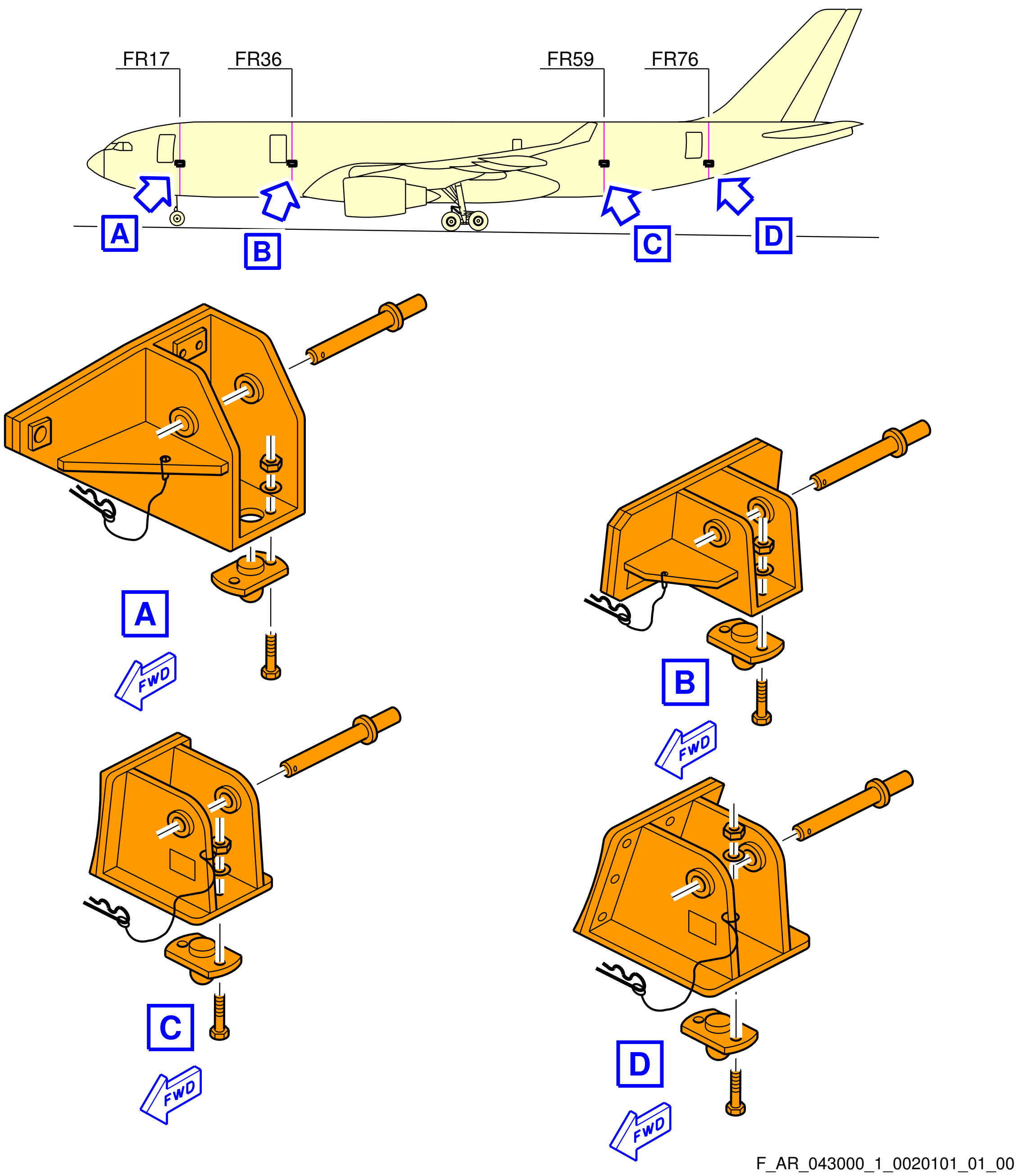
4. Tether Lines Installation
   The tethering load distribution must be symmetric around the fuselage. For this purpose, you must install the tethering lines on each side of the fuselage.
   Chapter 04-40-00 gives details on the ground anchors that you can use for tethering the aircraft.
   Figure FIGURE 04-30-00-991-003-A gives an example of tethering line installation.

**ON A/C A330-200 A330-300



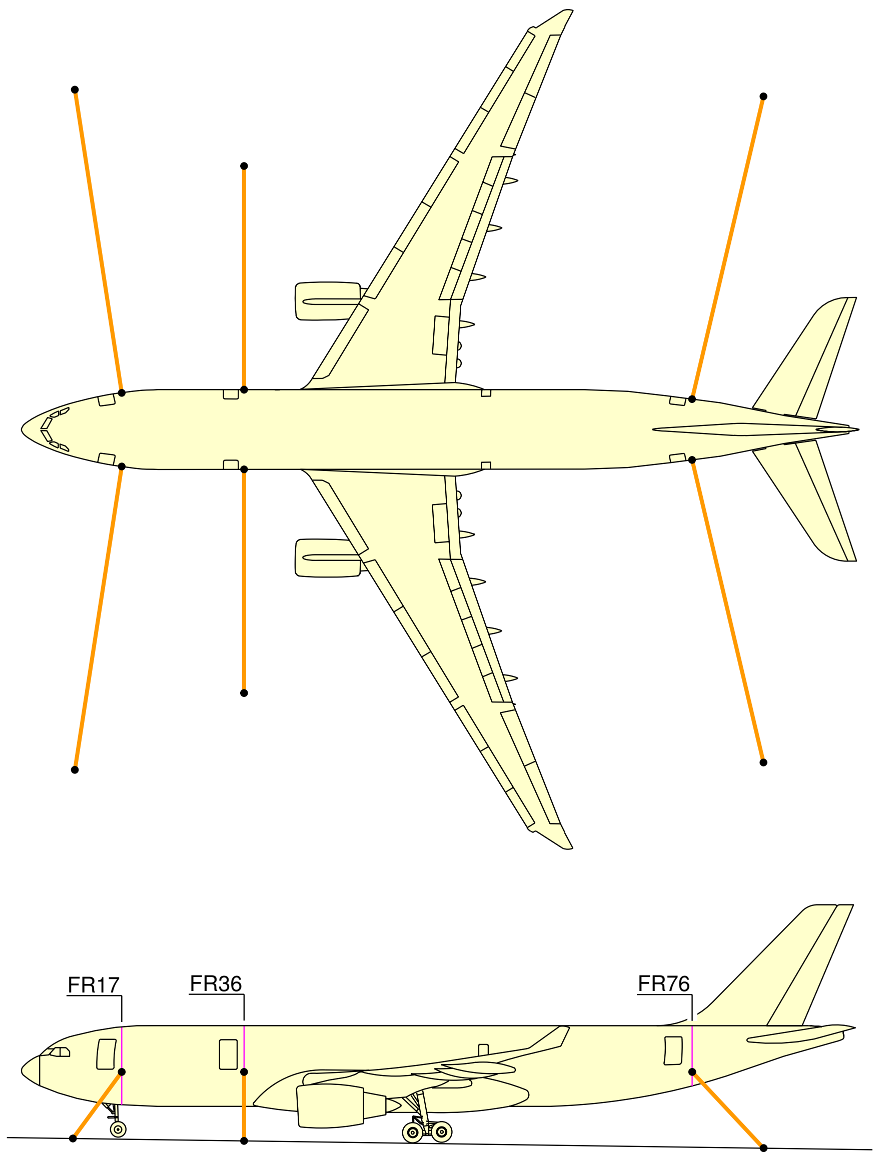
Tethering
Ground Wind Loads
FIGURE-04-30-00-991-001-A01

**ON A/C A330-200 A330-300



Tethering
Location of the Mooring Fittings
FIGURE-04-30-00-991-002-A01

**ON A/C A330-200 A330-300



Tethering
Typical Tethering Lines Installation
FIGURE-04-30-00-991-003-A01

ON A/C A330-200 A330-300

TASK 04-30-00-556-801-A01

Mooring

1. General
During the recovery operation, you can moor the aircraft to help the tethering.

2. Inspections
Make sure that there is no damage on the landing gears.

3. Job Setup References
Not applicable.

4. Job Set-up Information

A. Fixtures, Tools, Test and Support Equipment

REFERENCE	DESIGNATION
98F10201000000	MOORING KIT

Fixtures, Tools, Test and Support Equipment

TABLE 1

B. Referenced Information

REFERENCE	DESIGNATION
TASK 02-30-01-481-802-A02	TASK 02-30-01-481-802-A02-Installation of the Safety Devices on Landing Gears
04-40-00	04-40-00-GROUND ANCHORS
FIGURE 04-30-00-991-006-A	FIGURE 04-30-00-991-006-A-Mooring on the Main Landing Gear
FIGURE 04-30-00-991-007-A	FIGURE 04-30-00-991-007-A-Mooring
FIGURE 04-30-00-991-004-A	FIGURE 04-30-00-991-004-A-Mooring on the Nose Landing Gear
FIGURE 04-30-00-991-005-A	FIGURE 04-30-00-991-005-A-Mooring on the Nose Landing Gear

Referenced Information

TABLE 2

5. Procedure

Subtask 04-30-00-869-001-A01

A. Preparation

(1) Make sure that the landing gear safety devices are in position, see TASK 02-30-01-481-802-A02.

(2) Install the wheel chocks in front and behind the wheels.

Subtask 04-30-00-556-001-A01

B. Mooring of the Nose Landing Gear

(1) With the mooring kit:

(a) Put the 98F10201000000 MOORING KIT in position, see FIGURE 04-30-00-991-004-A.
See 04-40-00 for details of the ground anchors.

(2) With ropes:

(a) Attach the short ropes (1) with a diameter of 50.8 mm (2.0 in) on the towing fitting of the nose landing gear, see FIGURE 04-30-00-991-005-A and FIGURE 04-30-00-991-007-A.

NOTE : If manila or sisal rope is used, make sure that there is not too much tension on the rope because contraction can occur in wet weather.

(b) Attach the other ropes (2) with a diameter of 50.8 mm (2.0 in).

(c) Attach all the ropes on the ground with the ground anchors. Put tension on this assembly.

Subtask 04-30-00-556-002-A01

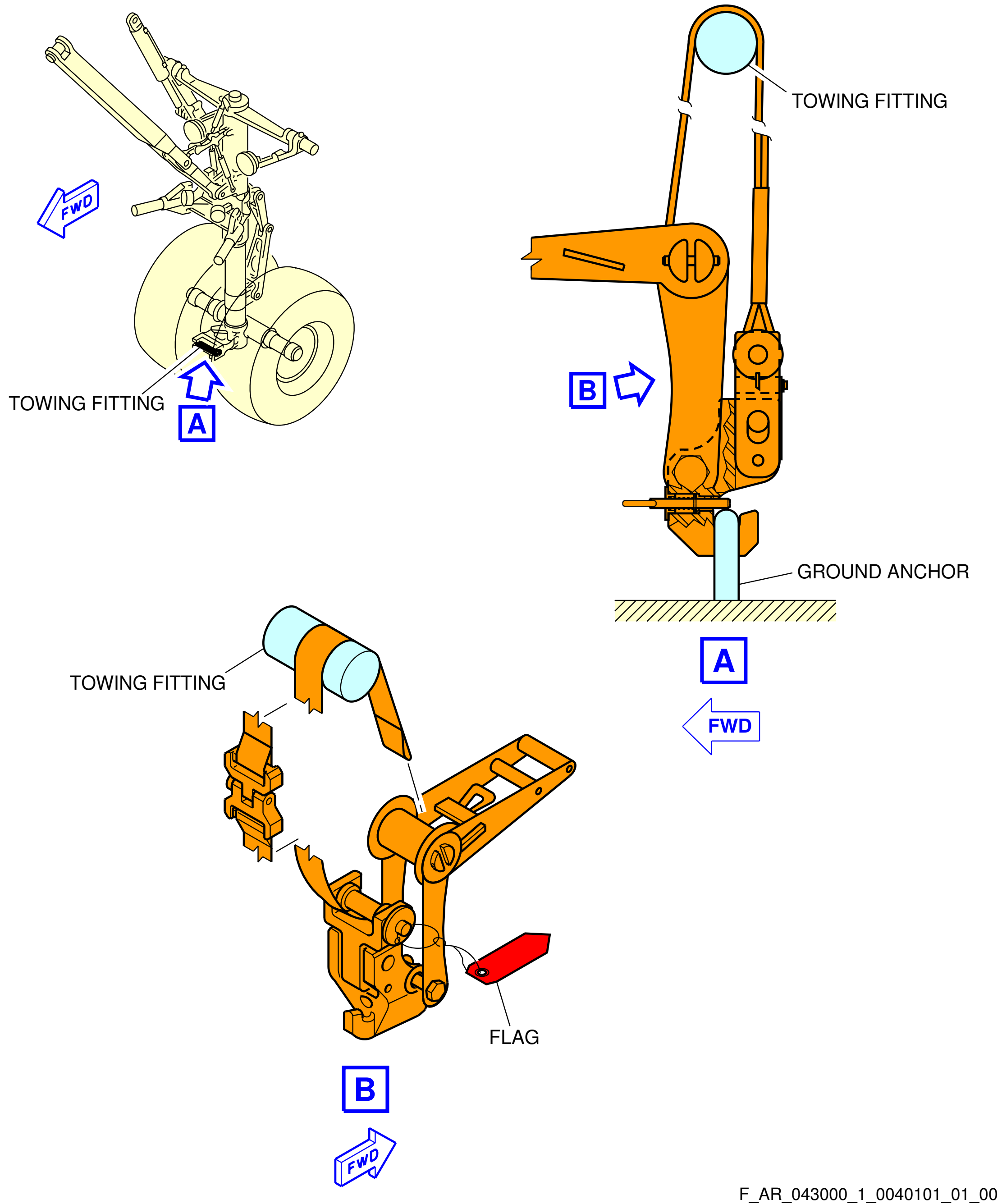
C. Mooring on the Main Landing Gear with Ropes

(1) Attach the ropes (3) and (4) with a diameter of 50.8 mm (2.0 in) on the debogging lugs of the main landing gear or by strapping both axles as only one lug is available (AFT or FWD), see FIGURE 04-30-00-991-006-A and FIGURE 04-30-00-991-007-A.

NOTE : If manila or sisal rope is used, make sure that there is not too much tension on the rope because contraction can occur in wet weather.

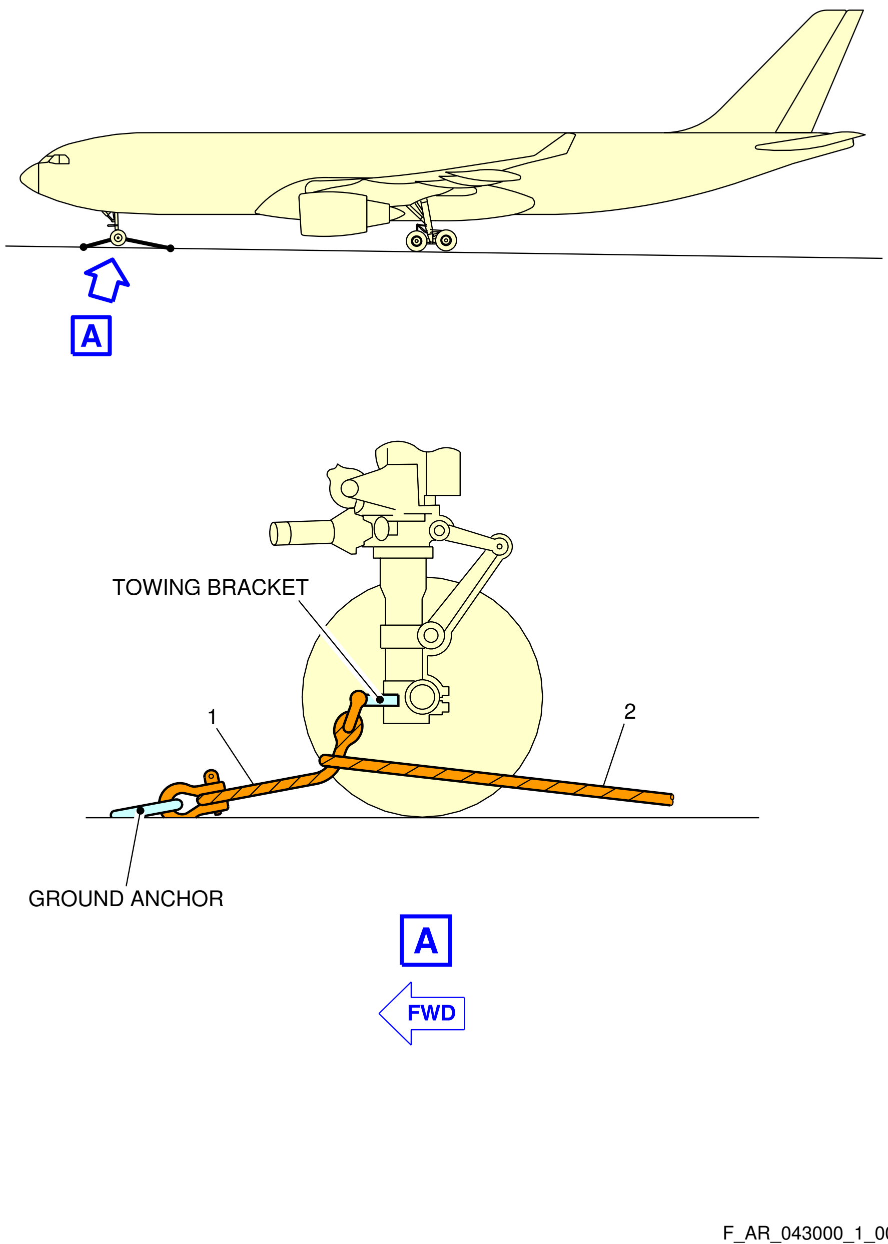
(2) Attach the ropes on the ground with the ground anchors. Put tension on this assembly.

**ON A/C A330-200 A330-300



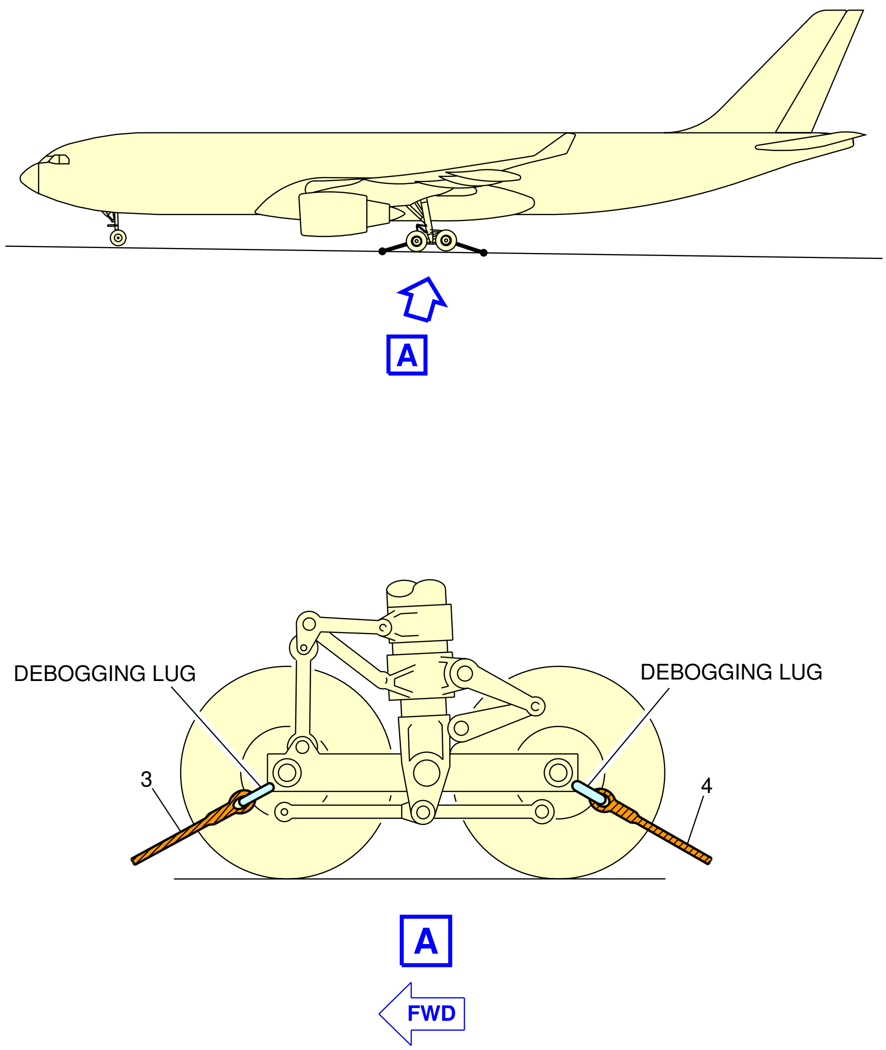
Mooring on the Nose Landing Gear
NLG Mooring Kit
FIGURE-04-30-00-991-004-A01

**ON A/C A330-200 A330-300



Mooring on the Nose Landing Gear
Installation of the Mooring Ropes
FIGURE-04-30-00-991-005-A01

**ON A/C A330-200 A330-300



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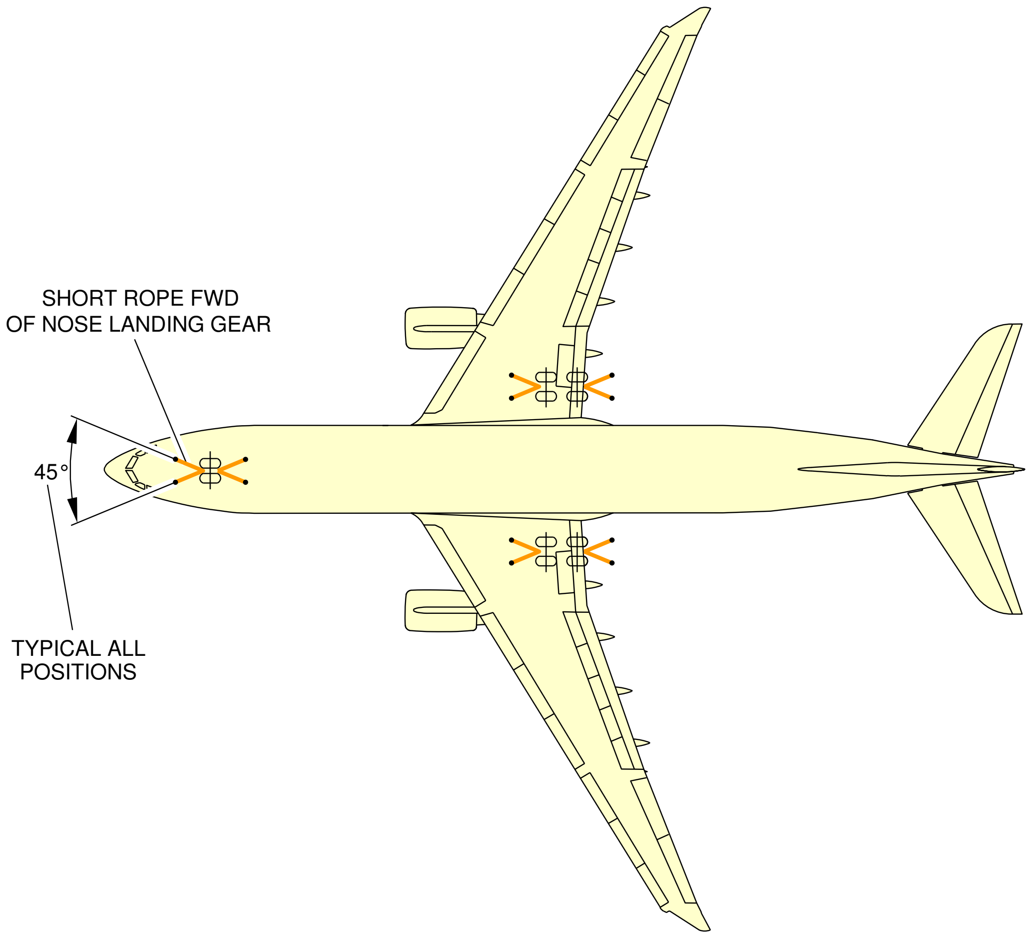
Mooring on the Main Landing Gear
Installation of the Mooring Ropes
FIGURE-04-30-00-991-006-A01

**ON A/C A330-200 A330-300



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Mooring
Position of the Mooring Ropes
FIGURE-04-30-00-991-007-A01

04-40 GROUND ANCHORS

04-40-00 GROUND ANCHORS

****ON A/C A330-200 A330-300**

DESC 04-40-00-001-A01

General

1. Ground Anchors for Tethers

NOTE : The information or principle contained in this chapter are given as a guide to assist an aircraft recovery.

There are three basic ways of supplying anchors for the tether lines:
- Commercial type ground anchors,
- Dead-man anchors,
- Heavy vehicles.

A. Commercial Type Ground Anchors
There are several types of commercially manufactured ground anchors on the market. Before installation of any type of ground anchor the manufacturer's instructions must be reviewed and the stability of the soil must be analyzed. Different sizes of these anchors are available to cater for the various loads. Most anchor units must be hammered or turned to a necessary depth depending on the stability of the soil. Generally longer models are required for loose soils and shorter ones for harder soils.

B. Dead-Man Anchors
Dead-man anchors are those constructed on the site from available materials such as vehicle wheels complete with tires, heavy cribbing timbers or railroad ties. A hole is excavated to an adequate depth and the materials are buried after being attached to cables. The hole is then back-filled with the cables forming an angle of approximate of 30 degrees between the wheel or timber and the ground. Use of this type of anchors requires a good experience of their use to ensure adequate strength.

C. Heavy Vehicles
It is possible to use large and/or heavy vehicles, if there is an adequate supply. Once the vehicle is used as anchor, it cannot be used for its original purpose during the recovery operation.

2. Anchor Holding Capacity

A. Anchor holding capacity is dependent on the type of soil and the depth of the anchor.

B. The holding capacity of the anchor will decrease as the moisture content of the soil increases.

C. It is necessary to test the soil stability:
- Evaluate the type of anchoring method,
- Determine the holding capacity of a given anchor in various soil types.

D. The soil stability can be tested in the field using a number of portable soil test probes.

04-50 SOIL STABILITY

04-50-00 SOIL STABILITY

****ON A/C A330-200 A330-300**

DESC 04-50-00-001-A01

General

1. Soil stability is of prime importance to ensure personnel safety, avoidance of secondary damage, selection of ground corrective action or of tooling to be used to allow implementation of the recovery procedure.

   NOTE : The information or principle contained in this chapter are given as a guide to assist an aircraft recovery.

   Basically you must make sure that ground remains stable for the intended purpose and keep in mind that load bearing capacity of soil might change with weather conditions.

04-80 MANUAL OPERATION OF SYSTEMS

04-80-00 MANUAL OPERATION OF SYSTEMS

****ON A/C A330-200 A330-300**

DESC 04-80-00-001-A01

General

1. Manual Operation of Flight Control Surfaces

   WARNING : MAKE SURE THAT THE TRAVEL RANGES OF THE FLIGHT CONTROL SURFACES AND THE LANDING GEARS AND RELATED DOORS ARE CLEAR. MOVEMENT OF THE CONTROL SURFACES AND LANDING GEARS/DOORS CAN CAUSE INJURY TO PERSONS AND/OR DAMAGE TO THE AIRCRAFT OR EQUIPMENT.

   WARNING : MAKE SURE THAT THE SAFETY DEVICES AND THE WARNING NOTICES ARE IN POSITION BEFORE YOU START A TASK ON OR NEAR THE FLIGHT CONTROLS, THE FLIGHT CONTROL SURFACES, THE LANDING GEARS AND RELATED DOORS AND COMPONENTS THAT MOVE. MOVEMENT OF COMPONENTS CAN KILL OR CAUSE INJURY TO PERSONS AND CAN CAUSE DAMAGE.

   WARNING : YOU MUST CONTACT AIRBUS BEFORE YOU MANUALLY OPERATE A SYSTEM OR REMOVE A COMPONENT WHEN THE AIRCRAFT IS IN AN ABNORMAL ATTITUDE OR DISABLED. THE AMM PROCEDURES ARE APPLICABLE ON AN AIRCRAFT IN A LEVEL CONFIGURATION ONLY.

   For the manual operation of flight control surfaces, see the AMM tasks that follow:
   - Manual Retraction of the Flaps, see AMM 27-50-00-866-804,
   - Manual Retraction of the Slats, see AMM 27-80-00-866-806,
   - Extension of the Spoilers For Maintenance, see AMM 27-60-00-866-801,
   - Retraction of the Spoilers After Maintenance, see AMM 27-60-00-866-802.

2. Manual Operation of Landing Gears and Doors
   For the manual operation of the landing gears, see TASK 04-80-20-867-801-A01.
   For the manual operation of the landing gear doors, see TASK 04-80-11-869-801-A01.

3. Manual Operation of Cargo Doors
   For the manual operation of the cargo doors, see TASK 04-80-13-869-801-A01.

04-80-11 LANDING GEAR DOORS

****ON A/C A330-200 A330-300**

TASK 04-80-11-869-801-A01

Manual Operation of the Landing Gear Door

1. General
These procedures can be used to open the Landing gears doors for Maintenance on ground. But only use these procedures when there is no structural damage.
If these procedures do not give the correct result, then move the aircraft with special recovery vehicles, see DESC 07-60-03-001-A01.

2. Inspections
Not applicable.

3. Job Setup References
See TASK 04-80-20-867-801-A01 for Manual Operation of the Landing Gear.

4. Job Set-up Information

A. Referenced Information

REFERENCE	DESIGNATION
TASK 04-80-20-867-801-A01	TASK 04-80-20-867-801-A01-Manual Operation of Landing Gears
TASK 02-30-01-481-802-A02	TASK 02-30-01-481-802-A02-Installation of the Safety Devices on Landing Gears
DESC 07-60-03-001-A01	DESC 07-60-03-001-A01-Moving Aircraft with Specialized Vehicles
FIGURE 04-80-11-991-005-A	FIGURE 04-80-11-991-005-A-Landing Gear Doors
FIGURE 04-80-11-991-006-A	FIGURE 04-80-11-991-006-A-Landing Gear Doors
FIGURE 04-80-11-991-005-A	FIGURE 04-80-11-991-005-A-Landing Gear Doors
FIGURE 04-80-11-991-007-A	FIGURE 04-80-11-991-007-A-Landing Gear Doors

Referenced Information

TABLE 1

5. Procedure

WARNING : MAKE SURE THAT LANDING GEAR DOWNLOCK PINS ARE INSTALLED IF THEIR INSTALLATION IS POSSIBLE.

WARNING : MAKE SURE THAT THE LANDING GEAR IS UPLOCKED BEFORE YOU OPEN THE GEAR DOORS MANUALLY. IF THE GEAR IS NOT UPLOCKED, THE WEIGHT OF THE GEAR CAN BE ON THE DOORS. IF YOU OPEN THE DOORS IN THIS CONDITION, THERE IS A RISK THAT THE LANDING GEAR WILL EXTEND BY GRAVITY AND CAUSE INJURY.

WARNING : MAKE SURE THAT THE TRAVEL RANGES OF THE FLIGHT CONTROL SURFACES AND THE LANDING GEARS AND RELATED DOORS ARE CLEAR. MOVEMENT OF THE CONTROL SURFACES AND LANDING GEARS/DOORS CAN CAUSE INJURY TO PERSONS AND/OR DAMAGE TO THE AIRCRAFT OR EQUIPMENT.

WARNING : MAKE SURE THAT THE SAFETY DEVICES AND THE WARNING NOTICES ARE IN POSITION BEFORE YOU START A TASK ON OR NEAR THE FLIGHT CONTROLS, THE FLIGHT CONTROL SURFACES, THE LANDING GEARS AND RELATED DOORS AND COMPONENTS THAT MOVE. MOVEMENT OF COMPONENTS CAN KILL OR CAUSE INJURY TO PERSONS AND CAN CAUSE DAMAGE.

Subtask 04-80-11-869-001-A01

A. Preparation

(1) Make sure that:
- The position of the L/G Control Lever 6GA agrees with the position of the landing gear,
- The free fall extension system control is in the OFF position.

Subtask 04-80-11-010-001-A01

B. Open the Nose Landing Gear (NLG) Doors

WARNING : MAKE SURE THAT THE LANDING GEAR AND DOOR TRAVEL RANGES ARE CLEAR. MOVEMENT OF THE LANDING GEAR AND DOORS CAN CAUSE INJURY AND/OR DAMAGE.

(1) Get access to the ground door-opening handle (Frame 17), see FIGURE 04-80-11-991-005-A and FIGURE 04-80-11-991-006-A.

(2) Remove the safety pin (2) from the ground door-opening handle (3).

(3) Push and hold the pushbutton (1) on the handle.

(4) Move the handle (3) down until it stops.

(5) Make sure that the NLG door uplock releases and the doors start to open. If necessary, manually push the doors to the correct position.

(6) Release the pushbutton (1) and install the safety pin (2) in the handle (3).

(7) Install the safety collars on the door actuators, see TASK 02-30-01-481-802-A02.

Subtask 04-80-11-010-002-A01

C. Open the Main Landing Gear (MLG) Doors

WARNING : MAKE SURE THAT THE LANDING GEAR AND DOOR TRAVEL RANGES ARE CLEAR. MOVEMENT OF THE LANDING GEAR AND DOORS CAN CAUSE INJURY AND/OR DAMAGE.

(1) Open the applicable access panel (149AB (149CB)), see FIGURE 04-80-11-991-005-A and FIGURE 04-80-11-991-007-A.

(2) Remove the safety pin (2) from the ground door-opening handle (1).

(3) Push and hold the latch-release (3).

(4) Move the handle (1) down until it stops.

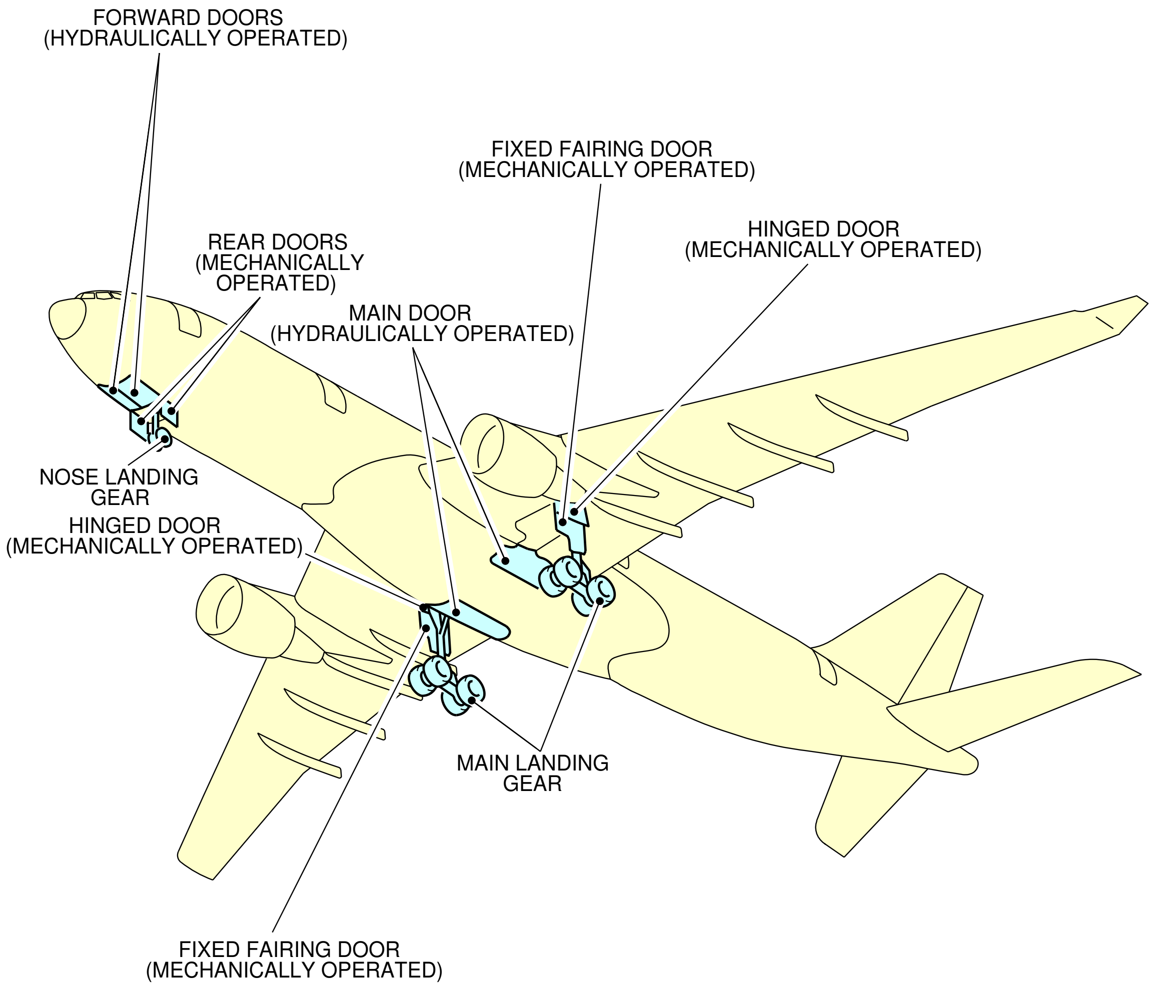
(5) Make sure that the MLG door uplock releases and that the door starts to open. If necessary, manually push the doors to the correct position.

(6) Release the latch-release (3) and make sure that it locks.

(7) Install the safety pin (2) in the handle (1).

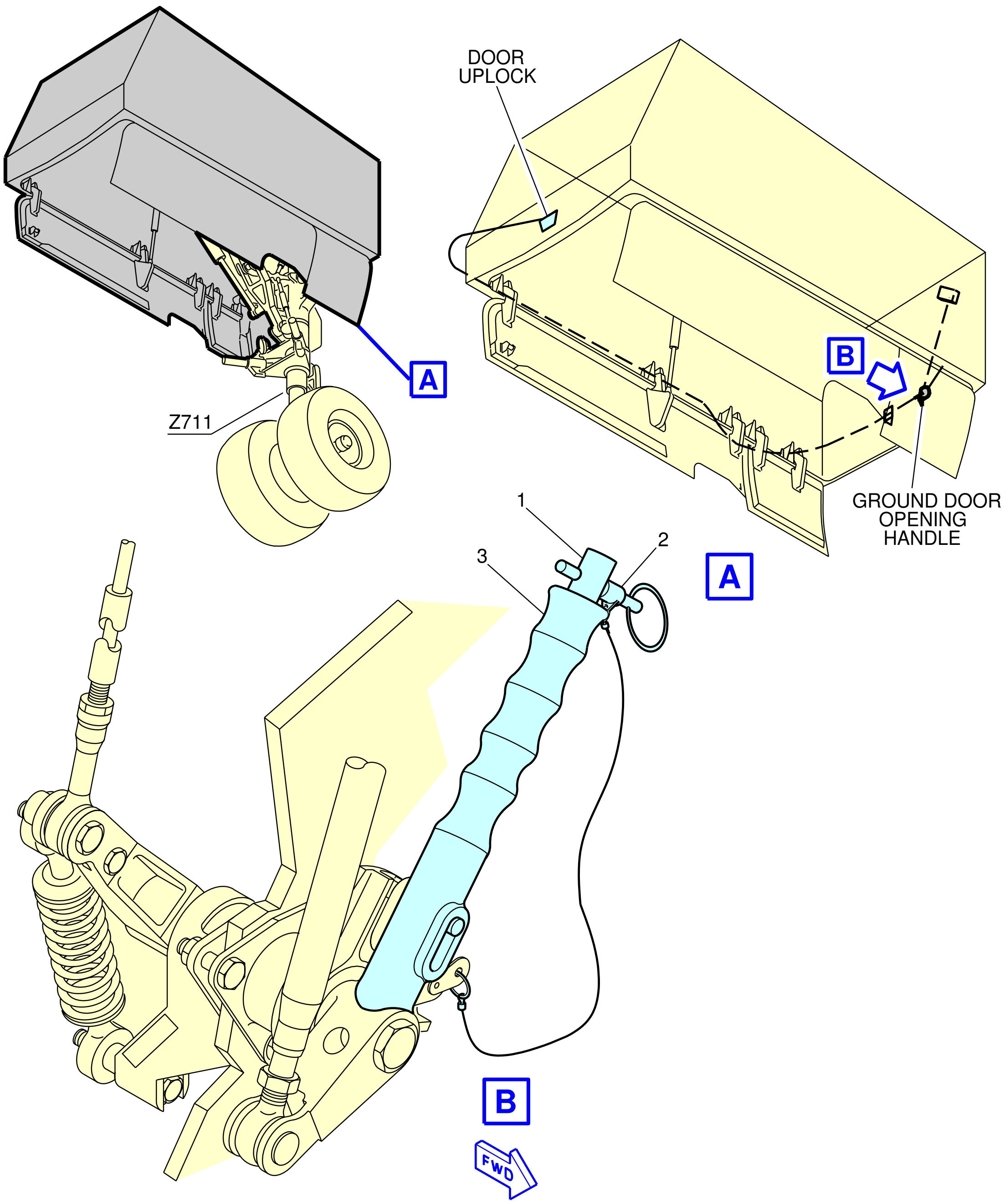
(8) Install the safety collars on the door actuators, see TASK 02-30-01-481-802-A02.

**ON A/C A330-200 A330-300



Landing Gear Doors
Landing Gear Doors - Lower view
FIGURE-04-80-11-991-005-A01

**ON A/C A330-200 A330-300



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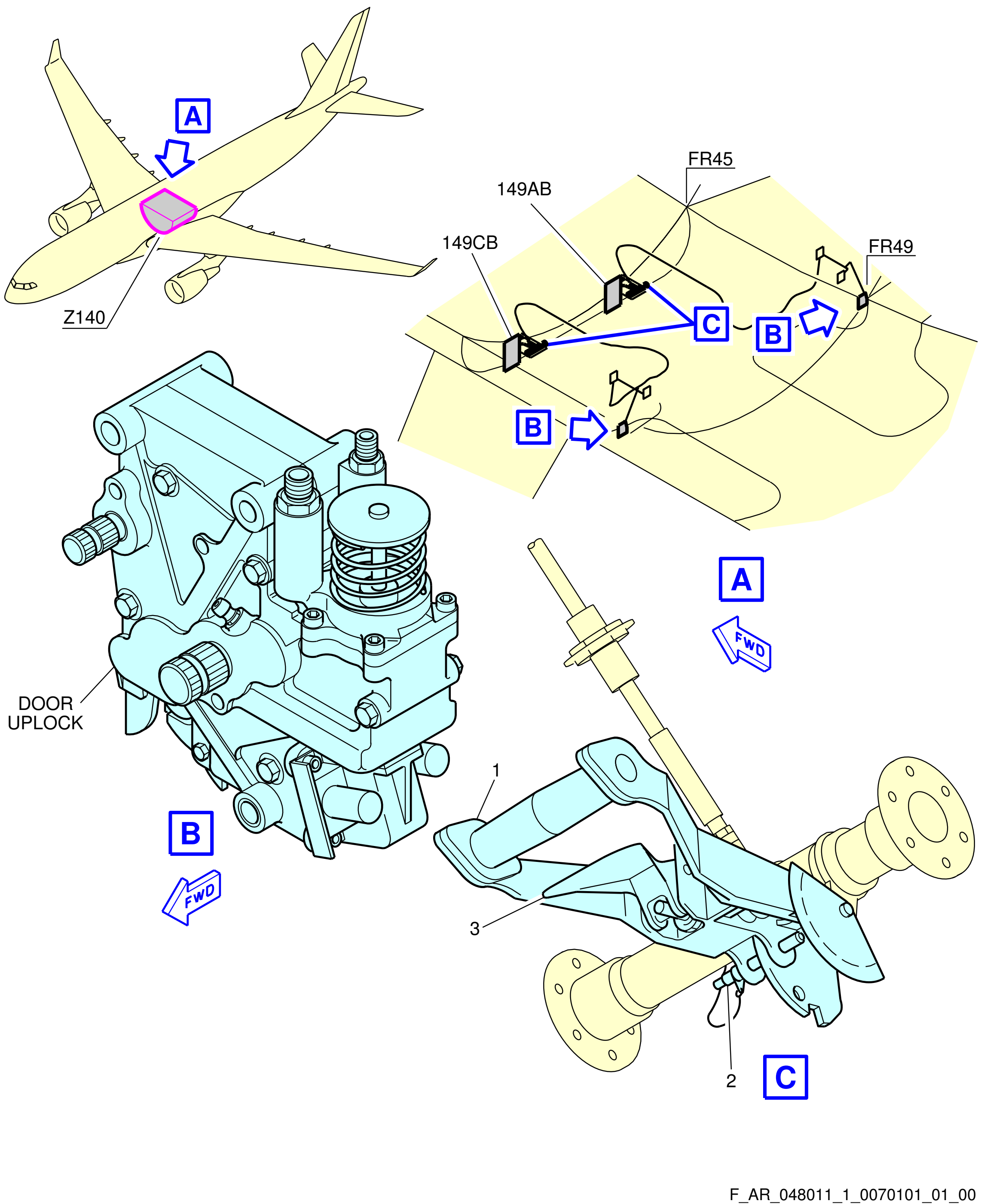
Landing Gear Doors
Nose Landing Gear
FIGURE-04-80-11-991-006-A01

**ON A/C A330-200 A330-300



Landing Gear Doors
Main Landing Gear
FIGURE-04-80-11-991-007-A01

04-80-13 CARGO DOORS

****ON A/C A330-200 A330-300**

TASK 04-80-13-869-801-A01

MANUAL OPERATION OF THE CARGO DOORS

1. General

WARNING : WHEN YOU OPEN/CLOSE THE CARGO COMPARTMENT DOOR, MAKE SURE THAT THERE ARE NO OBJECTS OR PERSONS IN THE TRAVEL RANGE OF THE DOOR. THE TRAVEL RANGE FOR THE CARGO COMPARTMENT DOOR MUST BE CLEAR OF PERSONS, ACCESS PLATFORMS, TOOLS AND EQUIPMENT. IF YOU DO NOT DO THIS, INJURY AND DAMAGE CAN OCCUR.

WARNING : OBEY THE HYDRAULIC SAFETY PROCEDURES. WORK ON THE HYDRAULIC SYSTEMS CAN BE DANGEROUS.

CAUTION : DO NOT OPEN THE DOOR IF THE WIND SPEED IS MORE THAN 40 KNOTS. WIND AT MORE THAN 40 KNOTS CAN CAUSE DAMAGE TO THE DOOR AND TO THE AIRCRAFT STRUCTURE. IF THE AIRCRAFT IS PUT INTO THE NOSE-INTO-WIND POSITION, THE MAXIMUM WIND SPEED CAN BE 50 KNOTS.

CAUTION : CLOSE THE DOOR BEFORE THE WIND SPEED INCREASES TO 60 KNOTS. IF THE WIND SPEED IS MORE THAN 60 KNOTS, DAMAGE TO THE DOOR AND TO THE AIRCRAFT STRUCTURE CAN OCCUR.

This chapter gives data on how you manually operate the cargo doors during a recovery procedure.
This task gives you the procedure to open the cargo doors if there is:

- An electrical system failure,

or

- A hydraulic pump failure.

NOTE : Two persons are necessary for these procedures.

2. Inspections
Not applicable.

3. Job Setup References
Not applicable.

4. Job Set-up Information

A. Fixtures, Tools, Test and Support Equipment

REFERENCE	DESIGNATION
98F52308751000	MDCD-MANUAL OPERATION ROD
98A52008509000	SLING-UNIVERSAL, DOORS
98F52308227002	STRUT - SUPPORT, CARGO DOOR

REFERENCE	DESIGNATION
98F52308279000	BAR - R/I ACTUATOR
98A52307628000	LOCK - SAFETY, CARGO DOOR ACTUATORS
98F523087389000	STRUT - SUPPORT, MAIN DECK CARGO DOOR

Fixtures, Tools, Test and Support Equipment

TABLE 1

B. Referenced Information

REFERENCE	DESIGNATION
DESC 09-10-12-002-A01	DESC 09-10-12-002-A01-Hydraulic System
AMM 52-38-00-010-802	
AMM 52-30-00-010-802	
FIGURE 04-80-13-991-001-A	FIGURE 04-80-13-991-001-A-Forward Cargo Door
FIGURE 04-80-13-991-002-A	FIGURE 04-80-13-991-002-A-Aft Cargo Door
FIGURE 04-80-13-991-003-A	FIGURE 04-80-13-991-003-A-Bulk Cargo Door
FIGURE 04-80-13-991-004-A	FIGURE 04-80-13-991-004-A-Forward and Aft Cargo Doors
FIGURE 04-80-13-991-010-A	FIGURE 04-80-13-991-010-A-Forward and Aft Cargo Doors
FIGURE 04-80-13-991-011-A	FIGURE 04-80-13-991-011-A-Forward and Aft Cargo Doors

Referenced Information

TABLE 2

5. Procedure

Subtask 04-80-13-010-001-A01

A. Opening of the Forward/Aft Cargo Doors with the Hydraulic Hand Pump

WARNING : DO NOT OPEN THE CARGO-COMPARTMENT DOORS WHILE THE RED WARNING LIGHT FLASHES. IF THE RED WARNING LIGHT FLASHES, REMAINING PRESSURE CAN CAUSE THE DOOR TO OPEN SUDDENLY AND CAN KILL OR CAUSE INJURY TO PERSONS OR CAUSE DAMAGE TO THE AIRCRAFT.

(1) Open the access doors 197CB and 196BB.

(2) Put the adjustable access platform in position at the forward or aft cargo compartment door, see FIGURE 04-80-13-991-001-A or FIGURE 04-80-13-991-002-A.

(3) Open the subsequent access doors as required:
- 122CR for the forward cargo door,
- 152NR for the aft cargo door.

(4) Put the access platform in position at the avionics compartment door 811.

(5) Open the avionics compartment door 811 and set the light switch to the ON position.

(6) Open the avionics compartment door 132AZ and set the light switch CARGO COMPT LIGHT to the ON position.

(7) Open the access panel 132UC, see AMM 52-30-00-010-802.

NOTE : The circuit breaker 1MJ must be open to simulate a malfunction of the electrical door control system or of the Yellow electrical pump.

(8) Push the handle flap and pull the locking handle to the UNLOCKED position.

(9) Make sure that all indicator flags are out.

(10) Press the pushbutton on the top of the latching handle and pull it to the UNLATCHED position.

(11) Put the door operation lever (on the door operation panel) in the OPEN position and hold it there during the operation of the hand pump.

NOTE : The door operation lever must go back automatically to the STOP position when you release it. If not, put it manually to the STOP position.

(12) Remove the hand pump lever from the ground service panel of the Green hydraulic system. See DESC 09-10-12-002-A01 for the location of the service panel of the Green hydraulic system.

(13) Make sure that the applicable cargo door can open freely.

(14) Install the hand pump lever on the hand pump (part of the Yellow ground service panel) and operate it until the cargo door is fully opened.

NOTE : When the cargo door is fully open, you can feel a large increase in force on the hand pump lever.

(15) Put the hand pump lever back to its storage position and close the access door 197CB.

(16) Install the applicable safety equipment, see SUBTASK 04-80-13-481-001-A01.

Subtask 04-80-13-010-002-A01

B. Opening of the Bulk Cargo Door

(1) Put the adjustable access platform in position below the bulk cargo door, see FIGURE 04-80-13-991-003-A.

(2) Push the button of the external door handle to release it from its recess.

(3) Move the external door handle to the OPEN position.

(4) Push the bulk cargo door inboard until its barrel locks are free from the related lock spigots of the fuselage.

NOTE : It is permitted that the door seal touches lightly the sensor housing when the bulk cargo door moves up.

(5) Put the door handle in the LOCKED position and push it into its recess.

(6) Open the bulk cargo door until the catch of the latch assembly engages with the latch arrester of the crossbeam.

Subtask 04-80-13-010-003-A01

C. Opening of the Forward/Aft Cargo Doors with the Crane

WARNING : DO NOT OPEN THE CARGO-COMPARTMENT DOORS WHILE THE RED WARNING LIGHT FLASHES. IF THE RED WARNING LIGHT FLASHES, REMAINING PRESSURE CAN CAUSE THE DOOR TO OPEN SUDDENLY AND CAN KILL OR CAUSE INJURY TO PERSONS OR CAUSE DAMAGE TO THE AIRCRAFT.

(1) Put the adjustable access platform in position at the forward or aft cargo door, see FIGURE 04-80-13-991-004-A.

(2) Put a crane with a min. capacity of 210.0 kg (463.0 lb) in position at the cargo door.

(3) Attach the ring of the three-leg sling (8) to the crane and put two of the three hooks on the ring.

NOTE : The hoisting sling of the cargo doors is part of the 98A52008509000 SLING-UNIVERSAL, DOORS. The hoisting sling includes the three-leg sling, the turnbuckle, the rope and the ring bolt.

(4) Put the ring of the turnbuckle (7) on the remaining hook of the three-leg sling (8).

(5) Remove the plastic cap (2) from the lower hoisting point (1).

(6) Install the ring bolt (5) with the rubber washer (4) in the lower hoisting point (1). Tighten the ring bolt (5) only with your hand.

(7) Attach the rope (6) to the ring of the ring bolt (5).

(8) Attach the end of the rope (6) on the hook of the turnbuckle (7).

(9) Carefully operate the crane until the leg of the hoisting sling is under load.

(10) Push the handle flap and pull the locking handle to the UNLOCKED position.

(11) Make sure that all indicator flags are out.

(12) Press the pushbutton on the top of the latching handle and pull it to the UNLATCHED position.

(13) If the door actuator is installed, continue as follows:
- open the 122CR for the forward cargo door,
- open the 152NR for the aft cargo door,
- turn the door operation lever (on the door operation panel) to the OPEN position and hold it there during the auxiliary operation.

NOTE : The door operation lever must go back automatically to the STOP position when you release it. If not, put it manually to the STOP position.

(14) Operate the crane to lift the cargo door to the fully open position.

NOTE : Make sure that the travel range of the cargo door is free.

(15) Install the safety lock to hold the cargo door in the fully open position, see SUBTASK 04-80-13-481-001-A01.

Subtask 04-80-13-481-001-A01

D. Installation of the Safety Support Equipment on the Forward/Aft Cargo Doors

NOTE : You must use the 98F52308227002 STRUT - SUPPORT, CARGO DOOR or the 98F52308279000 BAR - R/I ACTUATOR if you remove the door actuator or the associated attachment fittings.

(1) Installation of the 98A52307628000 LOCK - SAFETY, CARGO DOOR ACTUATORS on the Door Actuator:

(a) Remove the knurled screws and open the 98A52307628000 LOCK - SAFETY, CARGO DOOR ACTUATORS.

(b) Put the 98A52307628000 LOCK - SAFETY, CARGO DOOR ACTUATORS on the piston of the door actuator and close the 98A52307628000 LOCK - SAFETY, CARGO DOOR ACTUATORS.

(c) Install the knurled screws and tighten them.

(2) Installation of the 98F52308227002 STRUT - SUPPORT, CARGO DOOR or the 98F52308279000 BAR - R/I ACTUATOR:

(a) Put the lower end of the 98F52308227002 STRUT - SUPPORT, CARGO DOOR at the fuselage frame and install the pip-pin in the attachment hole, see FIGURE 04-80-13-991-010-A and FIGURE 04-80-13-991-011-A.

(b) Loosen the jam nuts to adjust the length of the 98F52308227002 STRUT - SUPPORT, CARGO DOOR.

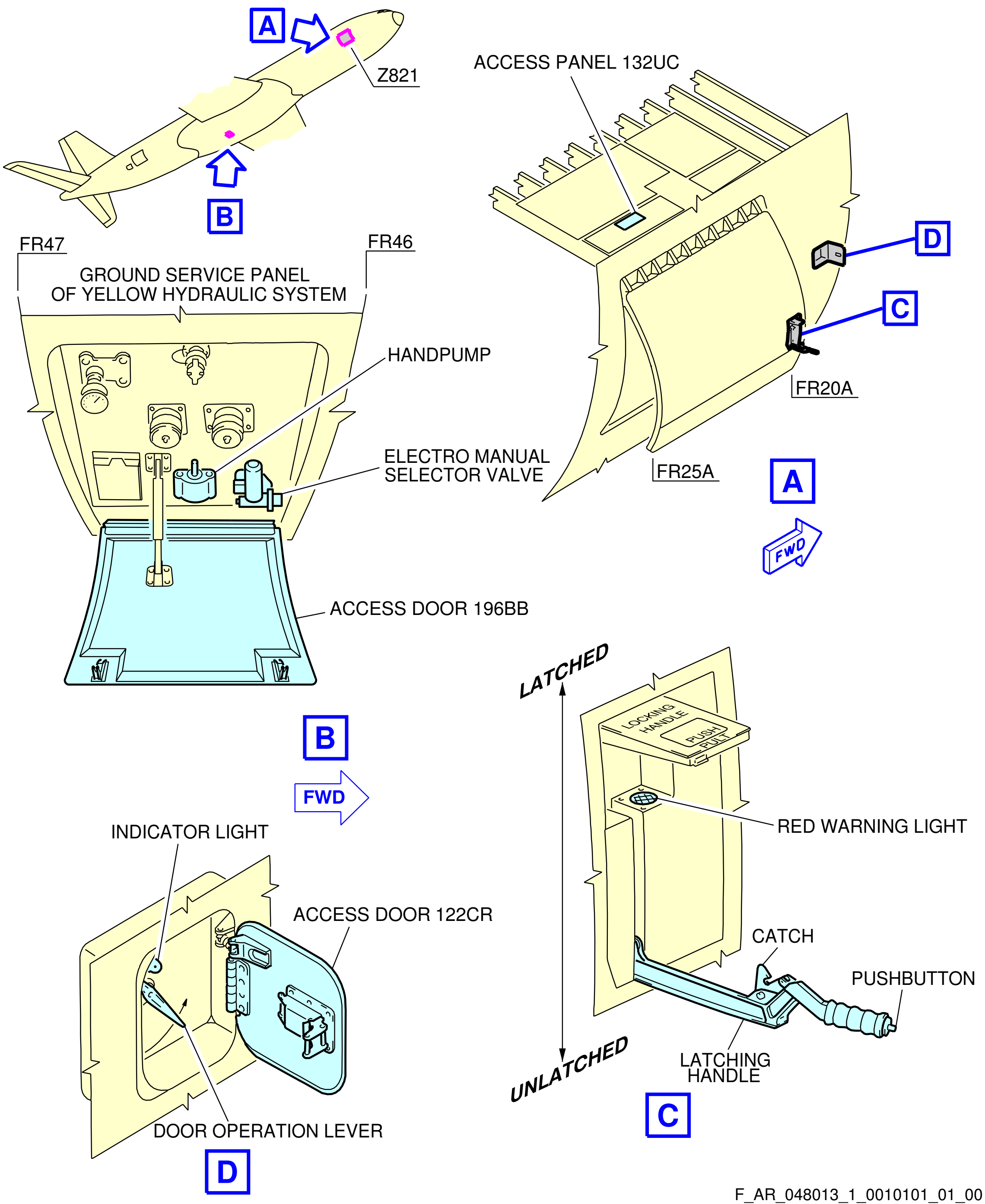
(c) Put the upper ends of the 98F52308227002 STRUT - SUPPORT, CARGO DOOR on the support fitting at the lateral edge members of the cargo door.

(d) Turn the spindle until the holes in the upper ends of the 98F52308227002 STRUT - SUPPORT, CARGO DOORand the holes in the support fittings are aligned.

(e) Install the pip-pins in the support fittings to attach the upper ends of the 98F52308227002 STRUT - SUPPORT, CARGO DOORto the lateral edge members.

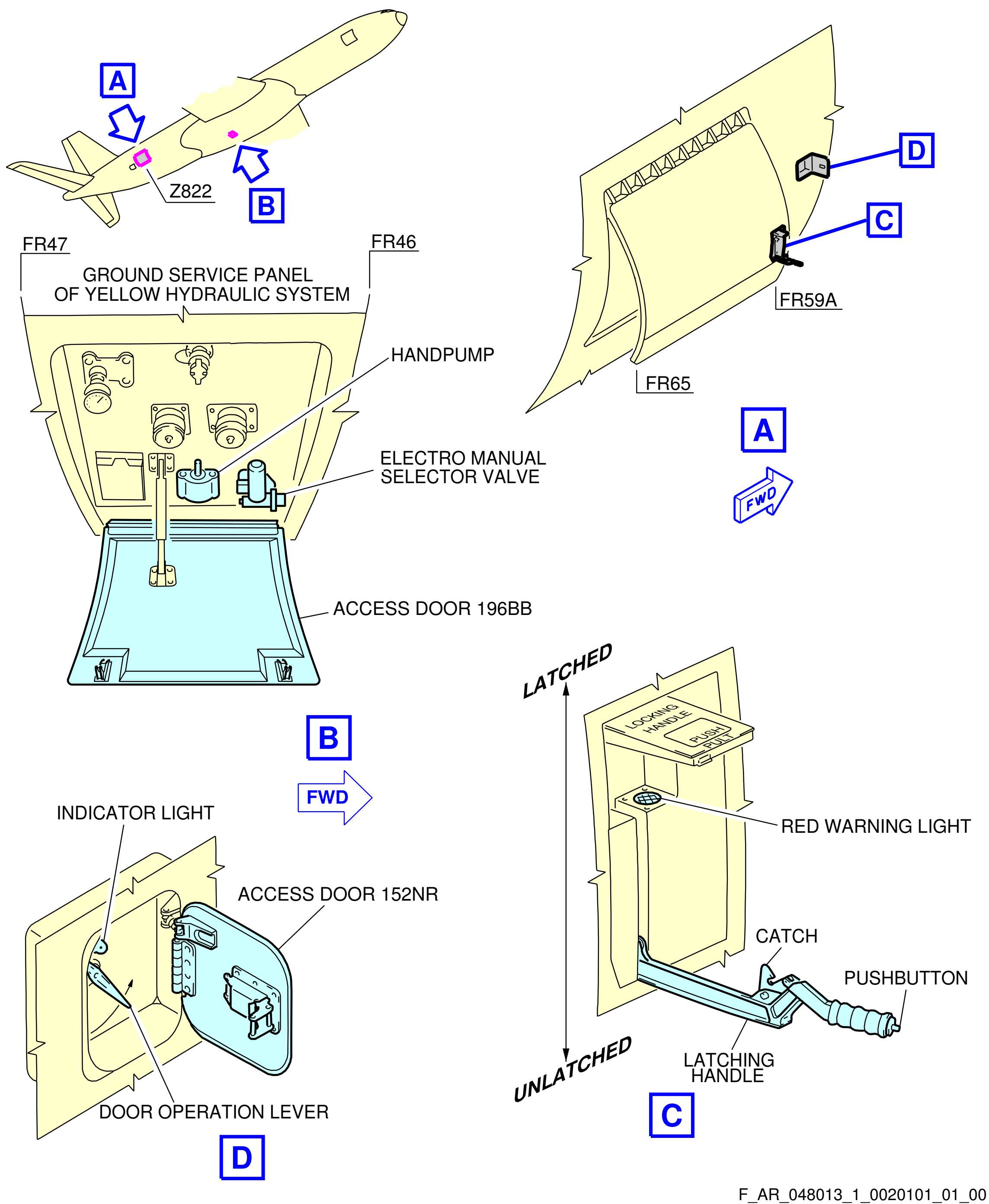
(f) Tighten the jam nuts to keep the length of the 98F52308227002 STRUT - SUPPORT, CARGO DOORconstant.

**ON A/C A330-200 A330-300



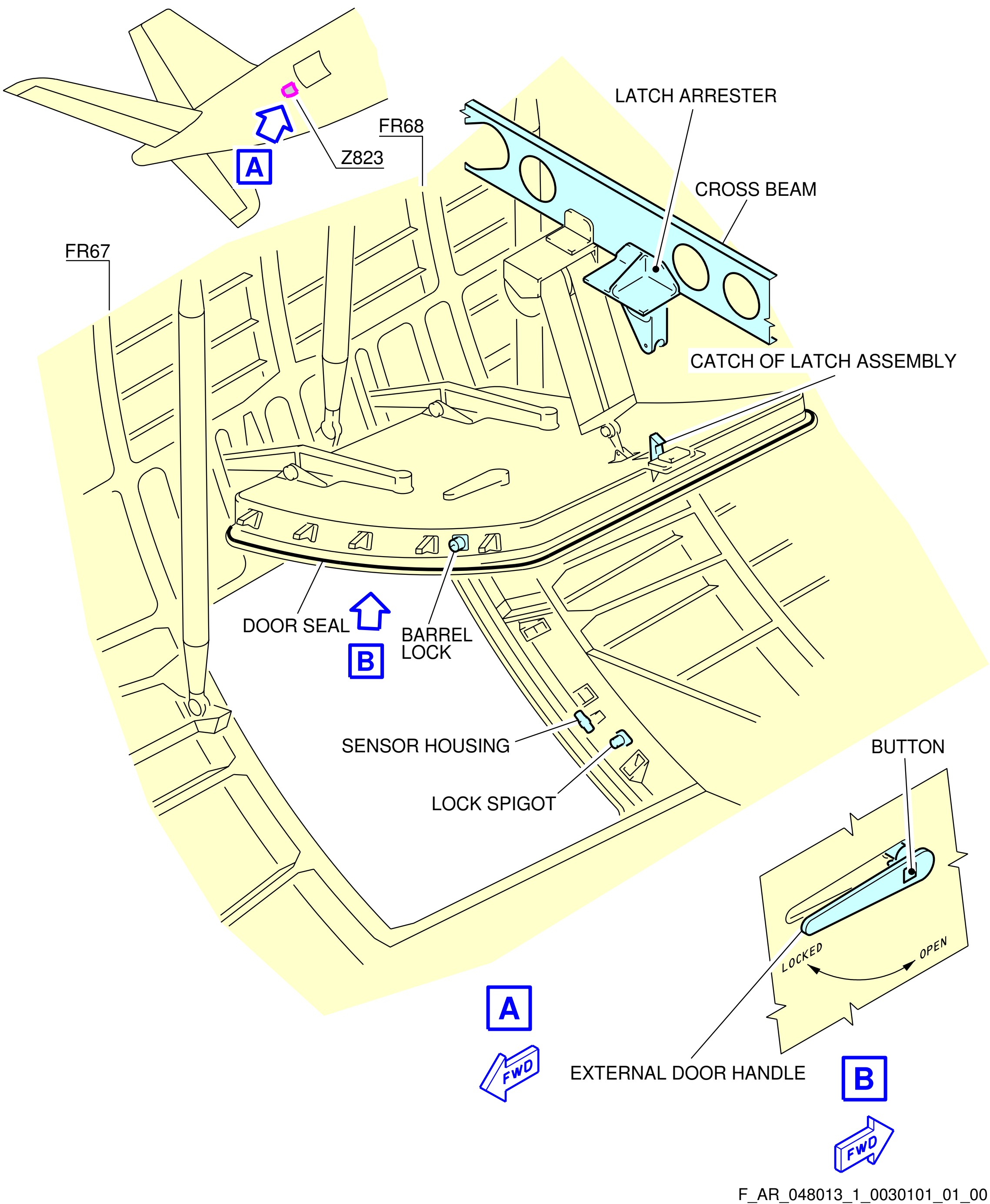
Forward Cargo Door
Manual Operation
FIGURE-04-80-13-991-001-A01

**ON A/C A330-200 A330-300



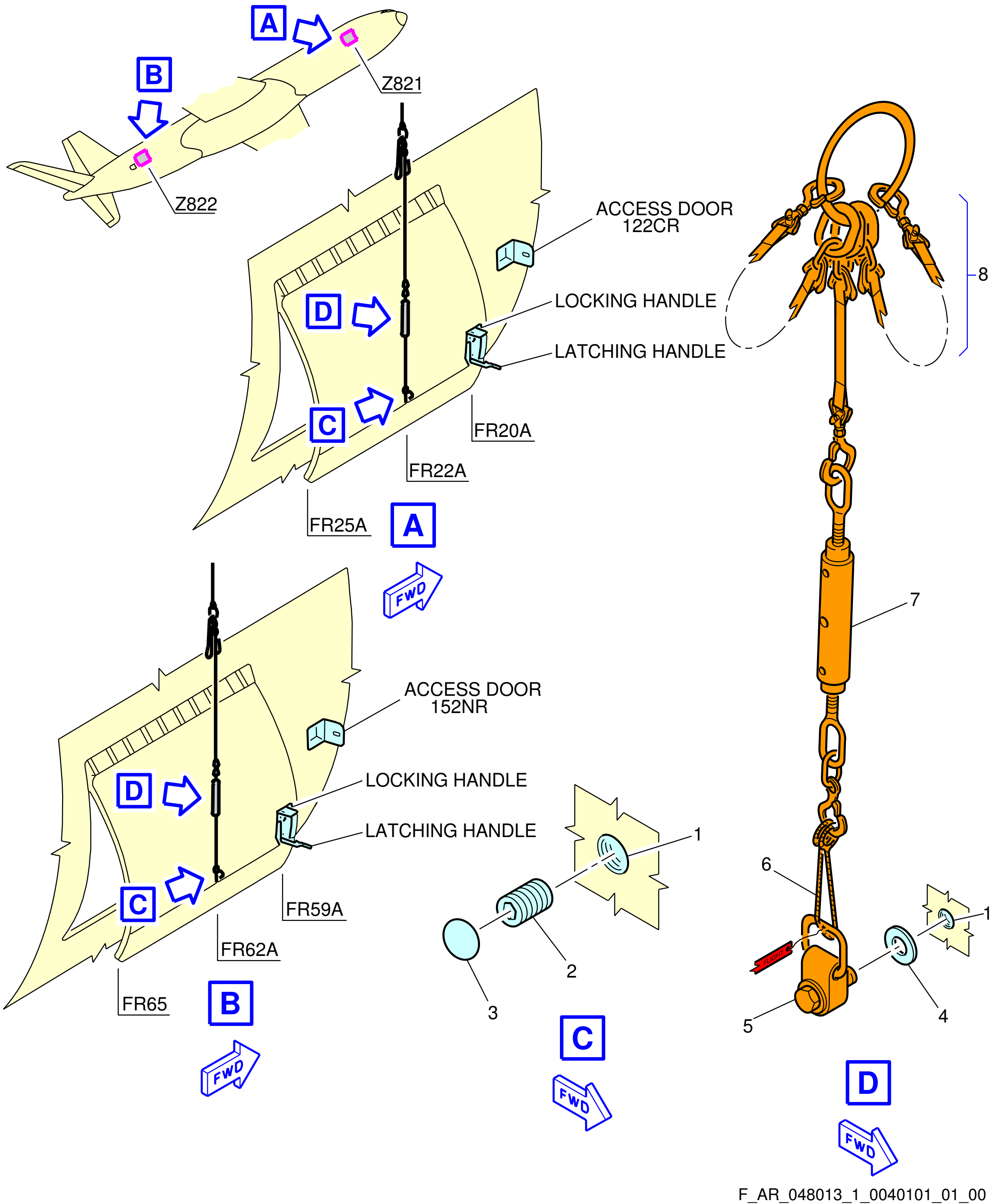
Aft Cargo Door
Manual Operation
FIGURE-04-80-13-991-002-A01

**ON A/C A330-200 A330-300



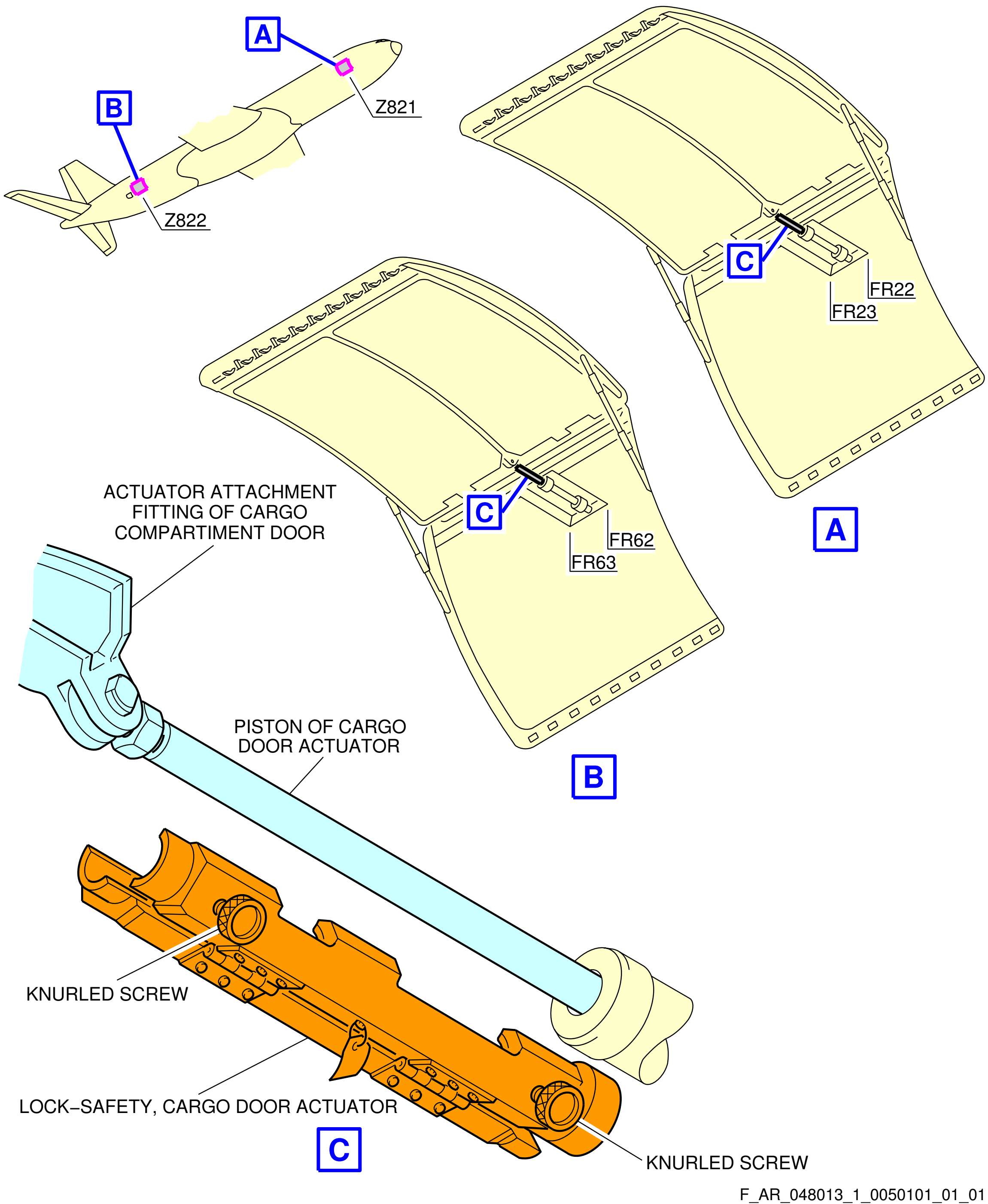
Bulk Cargo Door
Manual Operation
FIGURE-04-80-13-991-003-A01

**ON A/C A330-200 A330-300



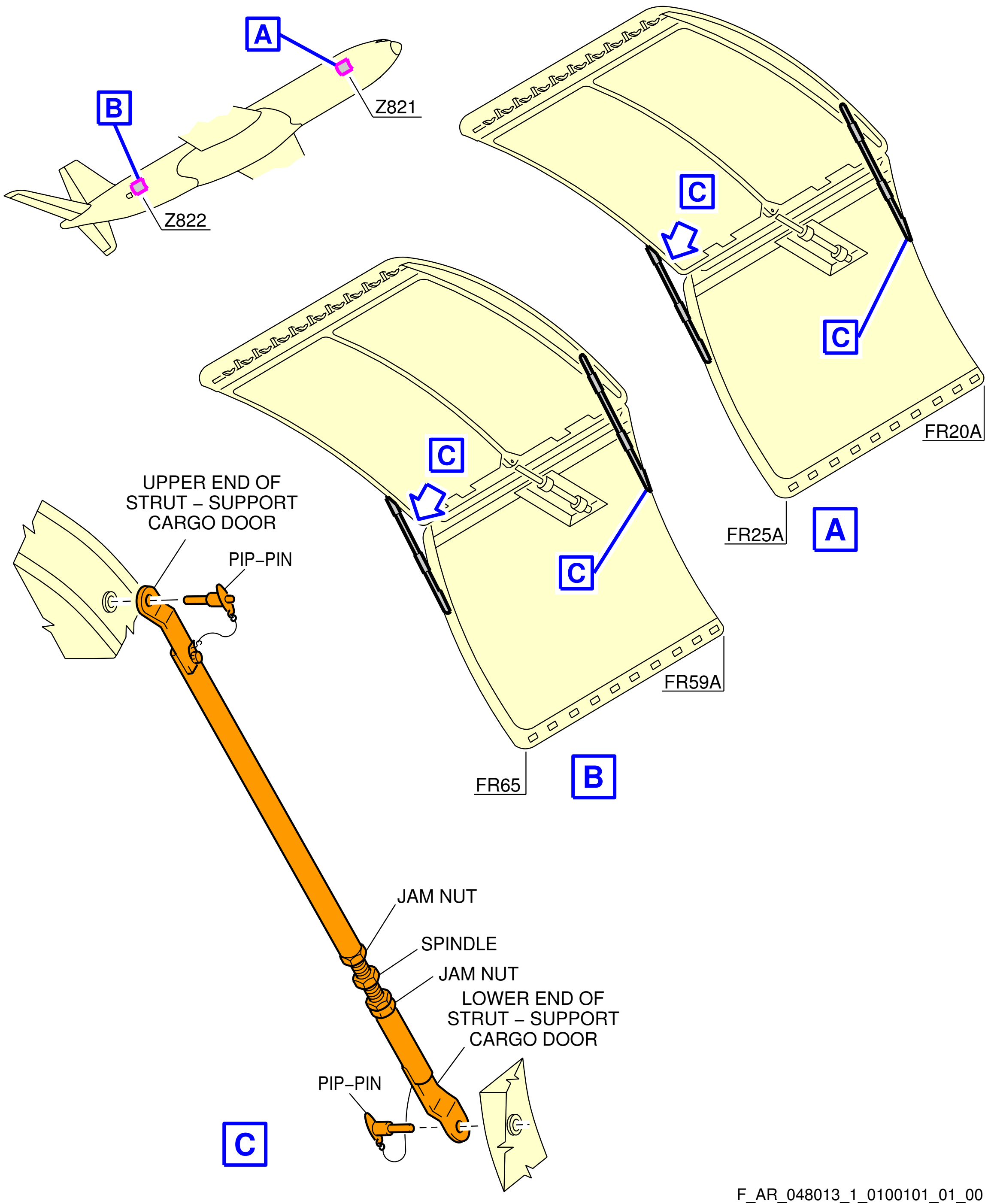
Forward and Aft Cargo Doors
Installation of the Crane
FIGURE-04-80-13-991-004-A01

**ON A/C A330-200 A330-300



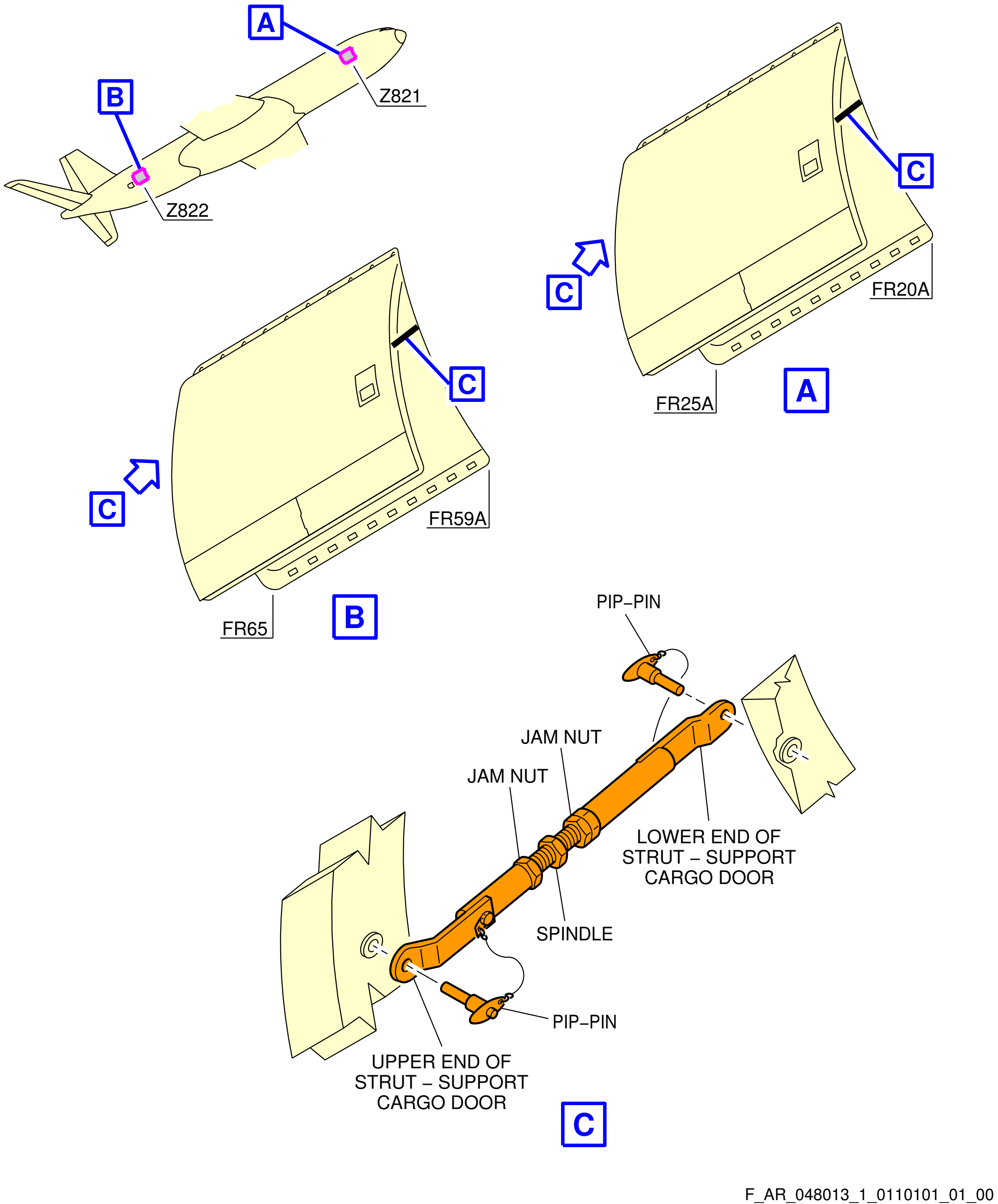
Forward and Aft Cargo Doors
Installation of the Safety Lock
FIGURE-04-80-13-991-005-A01

**ON A/C A330-200 A330-300



Forward and Aft Cargo Doors
Installation of the Support Struts
FIGURE-04-80-13-991-010-A01

**ON A/C A330-200 A330-300



Forward and Aft Cargo Doors
Installation of the Support Bars
FIGURE-04-80-13-991-011-A01

04-80-20 LANDING GEARS

****ON A/C A330-200 A330-300**

TASK 04-80-20-867-801-A01

Manual Operation of the Landing Gears

1. General

WARNING : LET THE BRAKES AND THE WHEELS BECOME COOL BEFORE YOU GO NEAR THE LANDING GEAR. DO NOT APPLY A LIQUID OR GAS FIRE EXTINGUISHER DIRECTLY ON A HOT WHEEL OR BRAKE UNIT. IF YOU DO NOT OBEY THESE PRECAUTIONS, THERE IS A RISK OF EXPLOSION.

WARNING : MAKE SURE THAT THE LANDING GEAR AND DOOR TRAVEL RANGES ARE CLEAR. MOVEMENT OF THE LANDING GEAR AND DOORS CAN CAUSE INJURY AND/OR DAMAGE.

WARNING : MAKE SURE THAT THE SAFETY DEVICES AND THE WARNING NOTICES ARE IN POSITION BEFORE YOU START A TASK ON OR NEAR THE FLIGHT CONTROLS, THE FLIGHT CONTROL SURFACES, THE LANDING GEARS AND RELATED DOORS AND COMPONENTS THAT MOVE. MOVEMENT OF COMPONENTS CAN KILL OR CAUSE INJURY TO PERSONS AND CAN CAUSE DAMAGE.

There are two Free-Fall conditions:
- With the aircraft electrical circuits serviceable,
- With the aircraft electrical circuits unserviceable.

2. Inspections
Not applicable.

3. Job Setup References
See TASK 04-80-11-869-801-A01 for Manual Operation of the Landing Gear Doors.

4. Job Set-up Information

A. Fixtures, Tools, Test and Support Equipment

REFERENCE	DESIGNATION
98DNSA20208080	RIGGING PIN
98F32104015000	COLLAR-SAFETY, CLG DOOR
98F32104042000	RIGGING-PIN, CLG UPLOCK
98F32104037000	COLLAR-SAFETY, CLG DOOR
97F32001001000	CONTROL UNIT-LEG FREE FALL ACTUATOR

REFERENCE	DESIGNATION
98F32104022000	DRIVE-SPLINED

Fixtures, Tools, Test and Support Equipment

TABLE 1

B. Referenced Information

REFERENCE	DESIGNATION
TASK 04-80-11-869-801-A01	TASK 04-80-11-869-801-A01-Manual Operation of Landing Gear Doors
TASK 02-30-01-481-802-A02	TASK 02-30-01-481-802-A02-Installation of the Safety Devices on Landing Gears
TASK 02-30-01-200-801-A01	TASK 02-30-01-200-801-A01-Landing Gear Survey
06-00-00	06-00-00-LEVELING AND LIFTING
02-30-01	02-30-01-LANDING GEAR
AMM 29-00-00-864-804	
AMM 28-00-00-864-802	
AMM 28-00-00-864-803	
AMM 24-41-00-861-801	
AMM 31-60-00-860-861	
AMM 32-16-00-010-801	
AMM 32-30-00-481-051	
AMM 53-00-00-000-801	
AMM 32-33-19-000-801	
AMM 32-33-18-000-801	
AMM 32-33-24-000-801	
FIGURE 04-80-20-991-001-A	FIGURE 04-80-20-991-001-A-Control Panels
FIGURE 04-80-20-991-001-A	FIGURE 04-80-20-991-001-A-Control Panels
FIGURE 04-80-20-991-002-A	FIGURE 04-80-20-991-002-A-ECAM Wheel Page
FIGURE 04-80-20-991-010-A	FIGURE 04-80-20-991-010-A-Landing Gear
FIGURE 04-80-20-991-007-A	FIGURE 04-80-20-991-007-A-Nose Landing Gear
FIGURE 04-80-20-991-008-A	FIGURE 04-80-20-991-008-A-Main Landing Gear

Referenced Information

TABLE 2

5. Procedure

Subtask 04-80-20-869-001-A01

A. Preparation

(1) Make sure that the aircraft is stable.

(2) Make sure that the PIN GROUNDLOCK(s) are correctly installed on the landing gears that are correctly extended and downlocked, see TASK 02-30-01-481-802-A02.

(3) In the cockpit, see FIGURE 04-80-20-991-001-A:

(a) On the panel 117VU:
- Make sure that the PARK BRK switch is set to ON.

(b) On the panel 312VU:
- Make sure that the Landing-Gear Control Lever is in the DOWN position,
- Put a warning notice in position to tell persons not to operate the landing gear,
- Make sure that the LDG GEAR GRVTY EXTN switches are in the OFF position.

(4) Make sure that the hydraulic systems are depressurized, see AMM 29-00-00-864-804, AMM 28-00-00-864-802 and AMM 28-00-00-864-803.

(5) Put safety barriers around the landing gear(s) that are not correctly extended.

(6) Lift the aircraft on jacks to the correct height before you lower the Landing Gear, see 06-00-00.

(7) Remove all damaged gear doors. If the doors are very damaged, you can break them to remove them.

Subtask 04-80-20-867-002-A01

B. Operation of the Free Fall Extension System with Aircraft Electrical Circuits Serviceable

WARNING : MAKE SURE THAT THE LANDING GEAR AND DOOR TRAVEL RANGES ARE CLEAR. MOVEMENT OF THE LANDING GEAR AND DOORS CAN CAUSE INJURY AND/OR DAMAGE.

WARNING : MAKE SURE THAT THE SAFETY DEVICES AND THE WARNING NOTICES ARE IN POSITION BEFORE YOU START A TASK ON OR NEAR THE FLIGHT CONTROLS, THE FLIGHT CONTROL SURFACES, THE LANDING GEARS AND RELATED DOORS AND COMPONENTS THAT MOVE. MOVEMENT OF COMPONENTS CAN KILL OR CAUSE INJURY TO PERSONS AND CAN CAUSE DAMAGE.

WARNING : MAKE SURE THAT LANDING GEAR DOWNLOCK PINS ARE INSTALLED IF THEIR INSTALLATION IS POSSIBLE.

(1) Energize the aircraft electrical circuits, see AMM 24-41-00-861-801.

(2) Do the Electronic Instrument System (EIS) start procedure (for the ECAM only), see AMM 31-60-00-860-861.

(3) On the panel 742VU:
- Make sure that the circuit breakers L/G Free Fall System 1, L/G Free Fall System 2 and Downlock Indicator are closed.

(4) On the panel 312VU:
- Set the LDG GEAR GRVTY EXTN switches to the DOWN position, see FIGURE 04-80-20-991-001-A. The landing gear doors will open and all the landing gears extend into the downlocked position.

(5) Make sure that:
- The applicable landing gear(s) is/are in the extended and downlocked position on the System Display (SD) Wheel Page and on the Independent Downlock Indication Light(s), see FIGURE 04-80-20-991-001-A. See FIGURE 04-80-20-991-002-A for the symbolic indications used on the SD Wheel Page,
- The landing gear(s) is/are extended and downlocked.

(6) Install the PIN GROUNDLOCK(s) on the extended gear(s), see TASK 02-30-01-481-802-A02.

Subtask 04-80-20-867-004-A01

C. Operation of the Free Fall Extension System with Aircraft Electrical Circuits Unserviceable

WARNING : MAKE SURE THAT THE LANDING GEAR AND DOOR TRAVEL RANGES ARE CLEAR. MOVEMENT OF THE LANDING GEAR AND DOORS CAN CAUSE INJURY AND/OR DAMAGE.

WARNING : MAKE SURE THAT THE SAFETY DEVICES AND THE WARNING NOTICES ARE IN POSITION BEFORE YOU START A TASK ON OR NEAR THE FLIGHT CONTROLS, THE FLIGHT CONTROL SURFACES, THE LANDING GEARS AND RELATED DOORS AND COMPONENTS THAT MOVE. MOVEMENT OF COMPONENTS CAN KILL OR CAUSE INJURY TO PERSONS AND CAN CAUSE DAMAGE.

WARNING : MAKE SURE THAT LANDING GEAR DOWNLOCK PINS ARE INSTALLED IF THEIR INSTALLATION IS POSSIBLE.

(1) Use an External Power Source to Operate the Free Fall System:

(a) Connect an External Power Source through the applicable 97F32001001000 CONTROL UNIT-LEG FREE FALL ACTUATOR to the applicable free fall actuator, see FIGURE 04-80-20-991-010-A.

NOTE : Do the following procedure to get access to the NLG Free Fall Actuator
- Put an access platform in position at the access door 811.
- Open the access door 811.

NOTE : Access to the MLG Free Fall Actuator is gained by removing the applicable floor panels, see AMM 53-00-00-000-801.

(b) The applicable landing gear doors will open and the gear(s) will extend.

(c) Install the PIN GROUNDLOCK(s) on the extended gear(s), see TASK 02-30-01-481-802-A02.

NOTE : If the pin groundlock(s) cannot be installed, do not lower the aircraft onto its gears. Do an inspection of the landing gear in accordance with TASK 02-30-01-200-801-A01. Repair or replace any damaged components before the aircraft is lowered.

(d) Fit the Safety Devices, see TASK 02-30-01-481-802-A02 on all of the landing gear doors to prevent movement of the doors while the aircraft is being moved.

(2) Manual Operation of the Free Fall System:

(a) Remove the free fall actuator from the free fall mechanism, see FIGURE 04-80-20-991-007-A and FIGURE 04-80-20-991-008-A. Use the following AMM procedures for removal of the electrical actuators:
- For removal of the NLG Free-Fall Actuator, see AMM 32-33-19-000-801.
- For removal of the MLG Free-Fall Actuator, see AMM 32-33-18-000-801.

(b) Install a splined drive 98F32104022000 DRIVE-SPLINED into the drive shaft of the free fall mechanism, see FIGURE 04-80-20-991-010-A.

(c) Remove the 97F32001001000 CONTROL UNIT-LEG FREE FALL ACTUATOR.

(d) Rotate the drive shaft with a standard wrench and the applicable landing gear and door uplocks will open and the L/G doors will open and the gear will extend.

(e) Remove the splined drive 98F32104022000 DRIVE-SPLINED from the drive shaft of the free fall mechanism.

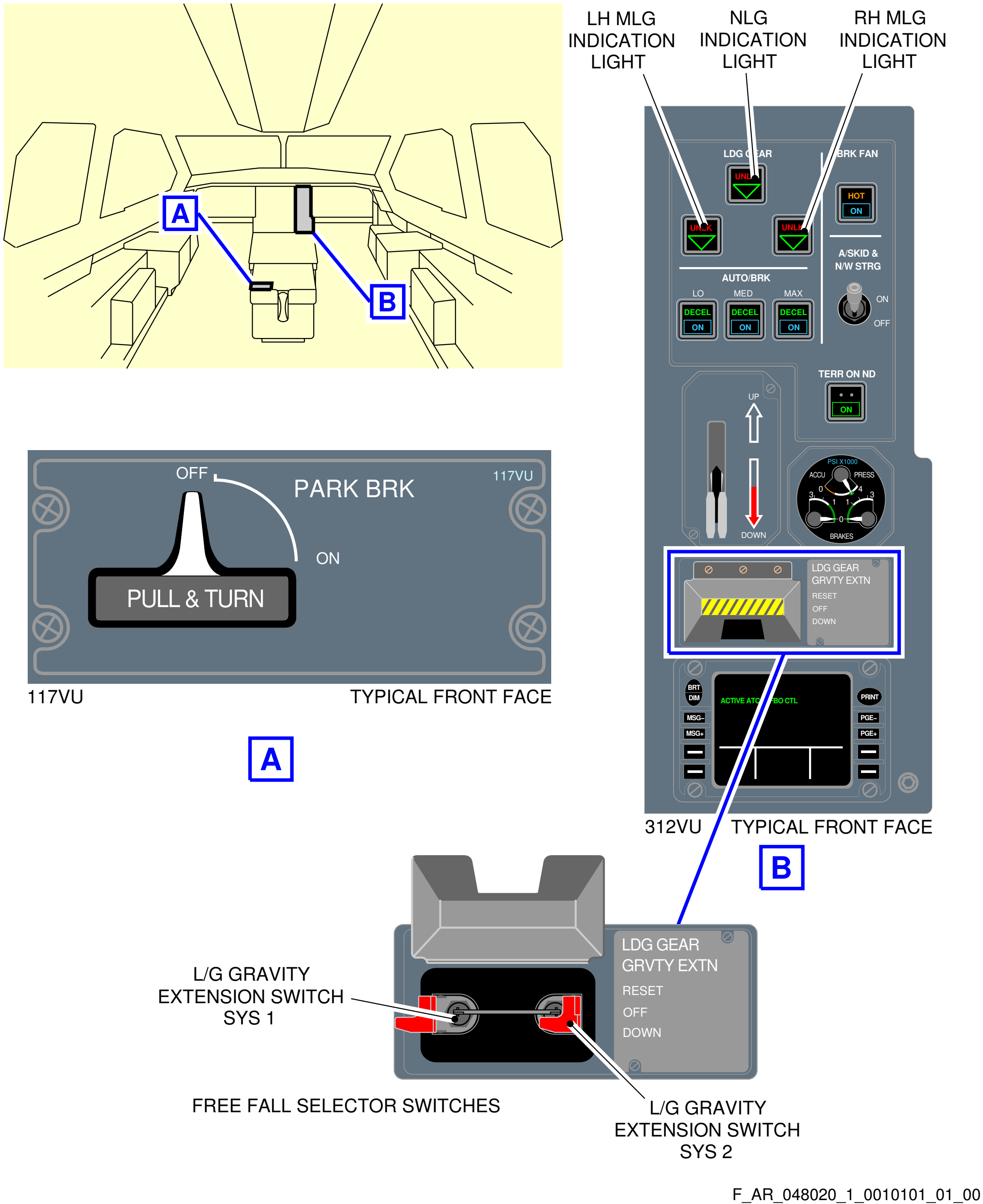
(f) Install the actuator on the free fall mechanism.

(g) Install the PIN GROUNDLOCK(s) on the extended gear(s), see TASK 02-30-01-481-802-A02.

NOTE : If the ground lock pin(s) cannot be installed, do not lower the aircraft onto its gears. Do an inspection of the landing gear in accordance with TASK 02-30-01-200-801-A01. Repair or replace any damaged components before the aircraft is lowered.

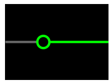
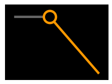
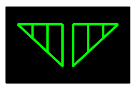
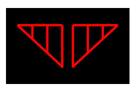
(h) Fit the Safety Devices, see TASK 02-30-01-481-802-A02 on all of the landing gear doors to prevent movement of the doors while the aircraft is being moved.

**ON A/C A330-200 A330-300



Control Panels
Landing Gear Indication and Free Fall Switches
FIGURE-04-80-20-991-001-A01

**ON A/C A330-200 A330-300

DISPLAY	CONDITION
	L/G DOOR CLOSED
	L/G DOOR IN TRANSIT
	L/G DOOR FULLY OPEN
XX	L/G DOOR FAULT
	GEAR LOCKED DOWN
	GEAR IN TRANSIT
	GEAR LOCKED UP
XX XX	L/G GEAR FAULT

DISPLAY	CONDITION
L/G CTL	ONE OR MORE OF THE L/G POSITION DOES NOT AGREE WITH THE L/G CONTROL LEVER POSITION (30 SECONDS AFTER SELECTION)
UP LOCK	UPLOCK ENGAGED BUT THE L/G IS LOCKED IN THE DOWN POSITION

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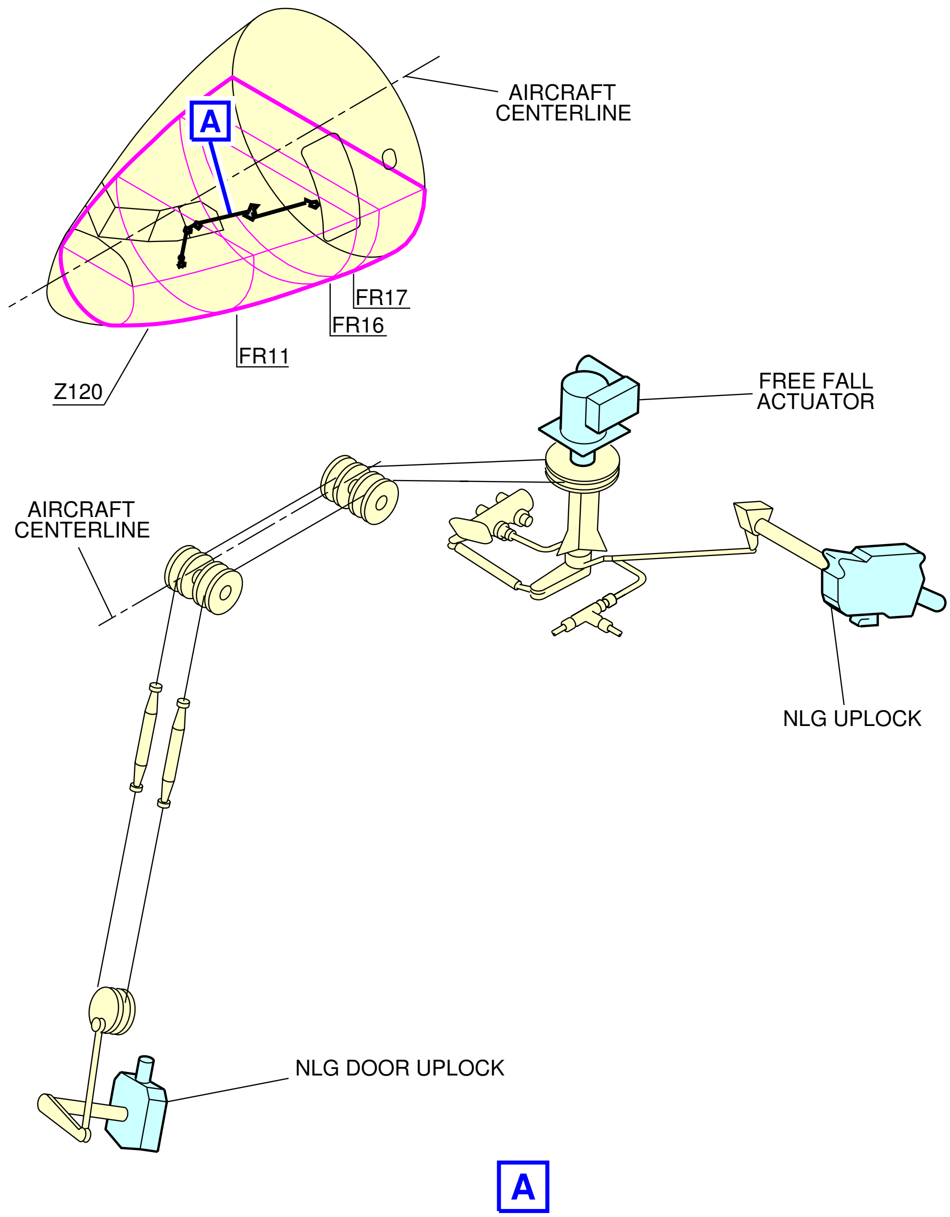
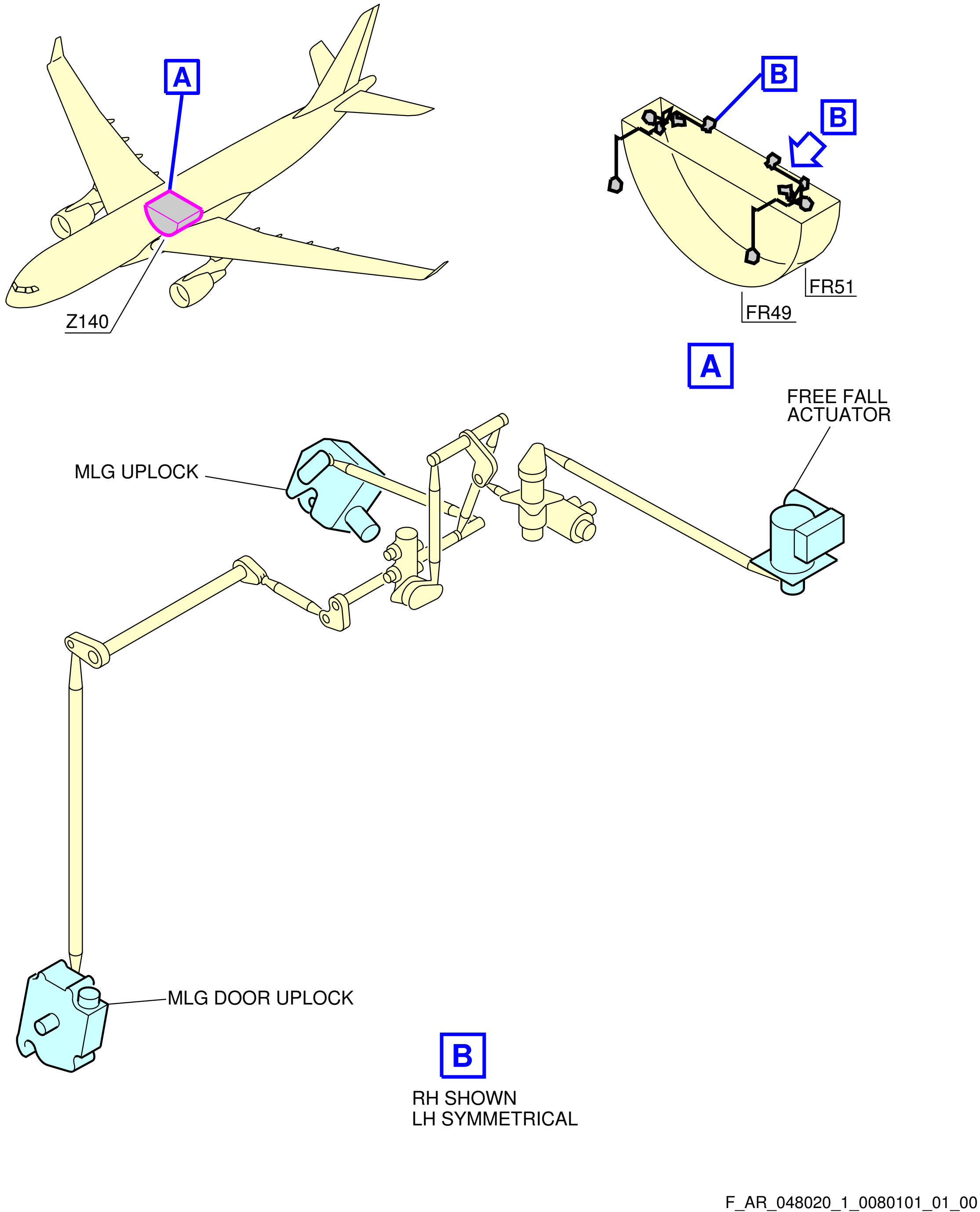
ECAM Wheel Page
ECAM Wheel Page - Symbols
FIGURE-04-80-20-991-002-A01

**ON A/C A330-200 A330-300



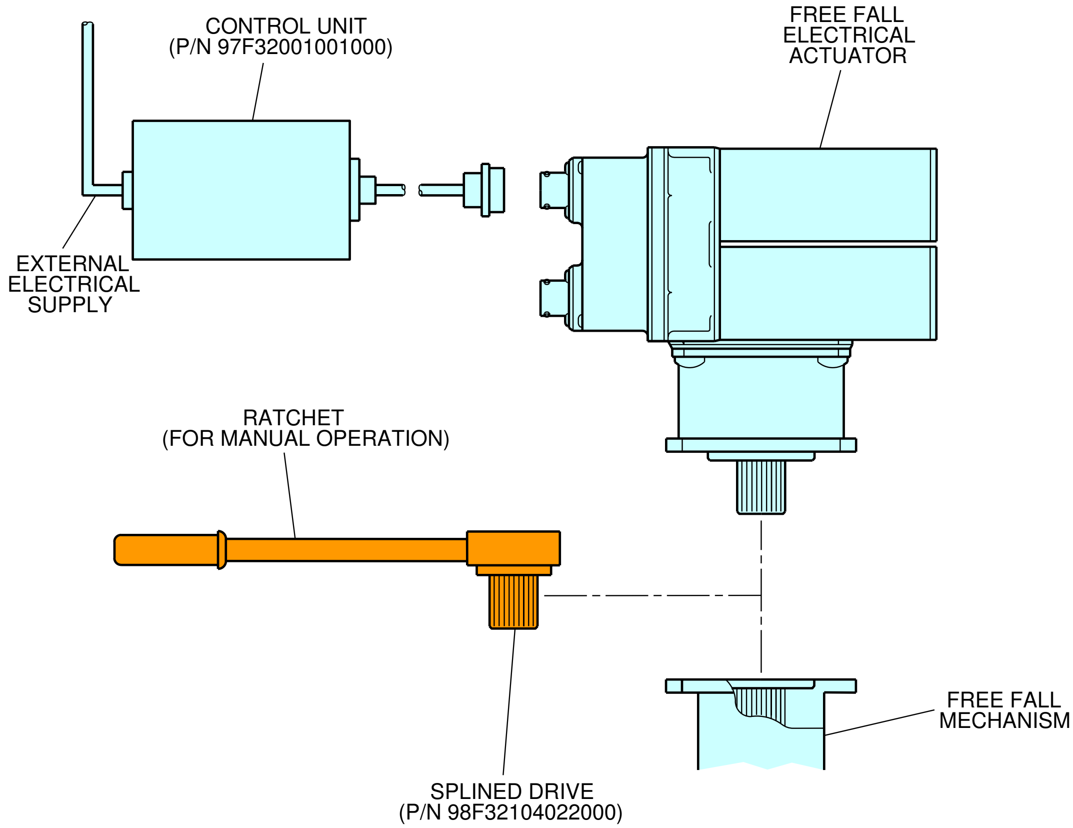
Nose Landing Gear
Free Fall Mechanism
FIGURE-04-80-20-991-007-A01

**ON A/C A330-200 A330-300



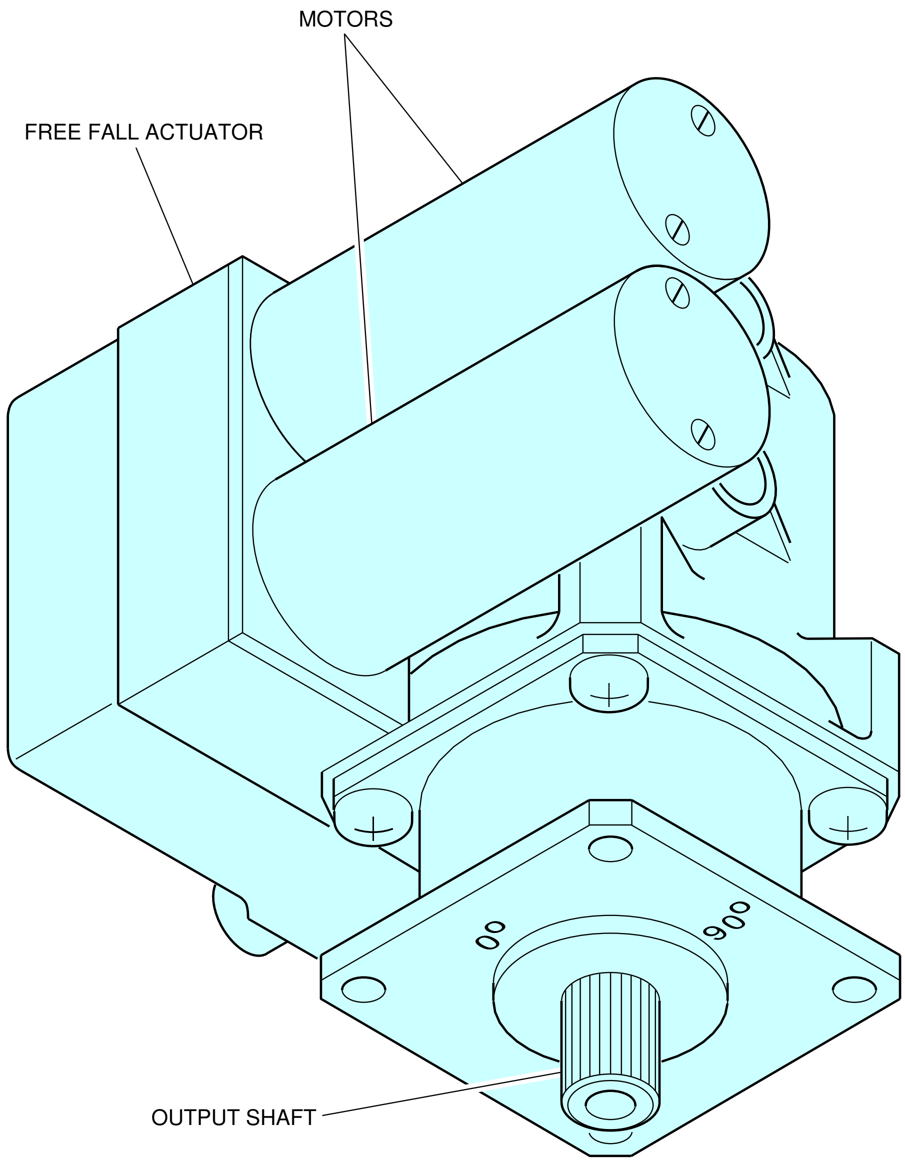
Main Landing Gear
Free Fall Mechanism
FIGURE-04-80-20-991-008-A01

**ON A/C A330-200 A330-300



Landing Gear
Ratchet for Manual Operation of the Free Fall Mechanism
FIGURE-04-80-20-991-010-A01

**ON A/C A330-200 A330-300



Free Fall Actuator
FIGURE-04-80-20-991-006-A01

WEIGHT REDUCTION

05-00 WEIGHT REDUCTION

05-00-00 WEIGHT REDUCTION

****ON A/C A330-200 A330-300**

DESC 05-00-00-001-A01

General

1. You must control aircraft weight.

WARNING : PUT SAFETY DEVICES ON THE CARGO DOOR OPENING MECHANISM TO PREVENT UNWANTED CLOSURE OF THE DOOR.

WARNING : YOU MUST CONTROL ALL MOVEMENT OF THE PAYLOAD DURING REMOVAL TO PREVENT TAIL TIPPING.

WARNING : YOU MUST CONTROL MOVEMENT AND SPEED OF CONTAINERS AND PALLETS TO PREVENT RAPID MOVEMENT OF PAYLOAD BECAUSE OF AIRCRAFT ATTITUDE.

WARNING : YOU MUST MONITOR CHANGE TO CG AND AIRCRAFT ATTITUDE DURING REMOVAL OF PAYLOAD.

Aircraft weight change will affect CG, aircraft stability and expected loads. It is commonly accepted that NRW should be the minimum possible, which implies removal of maximum weight.
Make sure that actions taken to reduce weight have an efficient effect.
Make sure that you get the expected results.
You can get maximum weight reduction if you remove weight from:

- Fuel tanks
- Cargo compartments.

NOTE : For disposition and locations of containers and pallets in the cargo compartments, see 09-10-14.

Sometimes, it is not necessary to remove the cargo payload or fuel. This depends on main factors such as:

- CG control
- Weight and amount of the cargo payload on board
- Need to excavate and build roadways for access
- Need to stabilize the ground so that cargo loaders and fuel trucks can go near the aircraft
- Expected removal: defueling time versus the time requirements to move the aircraft
- Capacity of the available lifting means
- Expected leveling/lifting loads
- Structural limitations on allowable leveling/lifting loads

- On-site storage capability of removed fuel.

Fuel and cargo payload can also remain on the aircraft to be used as ballast.

NOTE : Always be prepared for sudden attitude changes of the aircraft as the payload or fuel, etc. is removed. The changes can affect both the longitudinal and lateral axes of the aircraft.

For Fuel Weight Reduction see 05-10-00.
For Cargo Weight Reduction see 05-50-00.

05-10 DEFUELING

05-10-00 DEFUELING

****ON A/C A330-200 A330-300**

DESC 05-10-00-001-A01

General - Defueling

1. Defueling
   Defueling is one of the most important tasks to be carried out during an aircraft recovery operation. The importance relates not only to weight reduction, but also to control of the Center of Gravity (CG). The total mass of fuel on board the aircraft can be many tons. When the aircraft is in an abnormal attitude a significant shift in CG can take place as the aircraft is returned to a normal attitude. The procedures chosen to defuel a disabled aircraft should be made only after a thorough investigation has been carried out to determine:
   - The aircraft attitude
   - The extent of damage to the structure and the functional status of the fuel and electrical systems. The ability to energize the aircraft electrical power system through an external ground power source (or the aircraft batteries) will reduce the total time required for the defuel process. The lack of electrical power due to an inoperative electrical system, is the most common problem associated with the defuel process.

   The defuel system uses the same valves and fuel lines as the refuel system and components of the engine feed and transfer systems. The aircraft can be defueled through one or more of the four hose adapter couplings at the wing leading edges.
   The quantity of fuel removed will vary considerably dependant on the aircraft attitude and the method used to defuel.
   Sufficient storage for the removed fuel must be available. This is a very important issue specially when large amounts of fuel are involved. If the aircraft was involved in an incident where fuel contamination is suspected, it is necessary to quarantine the removed fuel. Only when the applicable authorities have made sure that this fuel is safe to use can it be used according to company and state regulations.
   Remove as much fuel as is possible prior to lifting the aircraft.
   Large quantities of fuel can be trapped in the tanks due to abnormal aircraft attitudes. It is possible that this fuel cannot be removed until the aircraft is level.
   When one main landing gear has collapsed (or is deeply bogged in mud) the transfer of fuel from the low wing to the opposite wing will reduce the weight of the low wing. This weight reduction will shift the CG of the opposite wing outboard from the main landing gear. This transfer process is only available when the fuel system is intact and power can be supplied to the fuel pumps and valves.
   The defuel process may have to be carried out in several steps, as the aircraft is levelled and stabilized several times.

Although the removal of the fuel is important, not all recovery operations will require its removal. Where relatively small quantities of fuel remain, it is not necessary to remove it. This decision can only be made once the survey has been completed. Decisions can also be made to reduce weight only to the point where maximum lifting and jacking loads will not be exceeded. This is not a recommended procedure and should be evaluated thoroughly.

2. General Preparation

WARNING : MAKE SURE THAT YOU OBEY ALL THE APPLICABLE SAFETY PRECAUTIONS WHEN YOU REMOVE FUEL OR WHEN YOU WORK IN AN ENVIRONMENT WHERE THERE IS FUEL.

WARNING : DO NOT SPILL FUEL ON THE ENGINES OR THE BRAKES. IF YOU SPILL FUEL ON ENGINES OR BRAKES THAT ARE HOT, IT CAN CAUSES FIRE.

Before you start the defuel, you must make sure that:

A. You obey all the safety precautions applicable to refuelling/defuelling.

B. The safety area is clearly identified and the tankers are in correct position, see FIGURE 05-10-00-991-004-A.

C. The aircraft is correctly grounded, see 09-10-13.

D. A ground cable connects the tanker to the MLG ground connection.

E. There are no open flames or smoking in the safety area.

F. Only personnel qualified to do the defuel operation are in the safety area.

G. All the equipment and material not necessary for the defuel procedure are moved out of the safety area.

H. The correct safety and fire fighting equipment is in position with the qualified personnel to operate it.

J. The escape lanes for the fuel tankers are clear of obstruction.

K. The fuel tankers have sufficient capacity for the quantity to be defueled.

L. Only the electrical equipment necessary for the defuel procedure is used.

M. You do not operate the aircraft main engines or the APU during the defuel procedure.

N. The electrical equipment you use will not create a spark.

P. Caps are installed on all damaged fuel pipes.

Q. All damaged electrical wiring and fuel pumps are isolated.

R. You only use pumps that are serviceable.

S. Do not do the defuel procedure in bad weather conditions. Lightning is dangerous.

T. Do not operate radio, radar equipment or mobile phone during the defuel procedure.

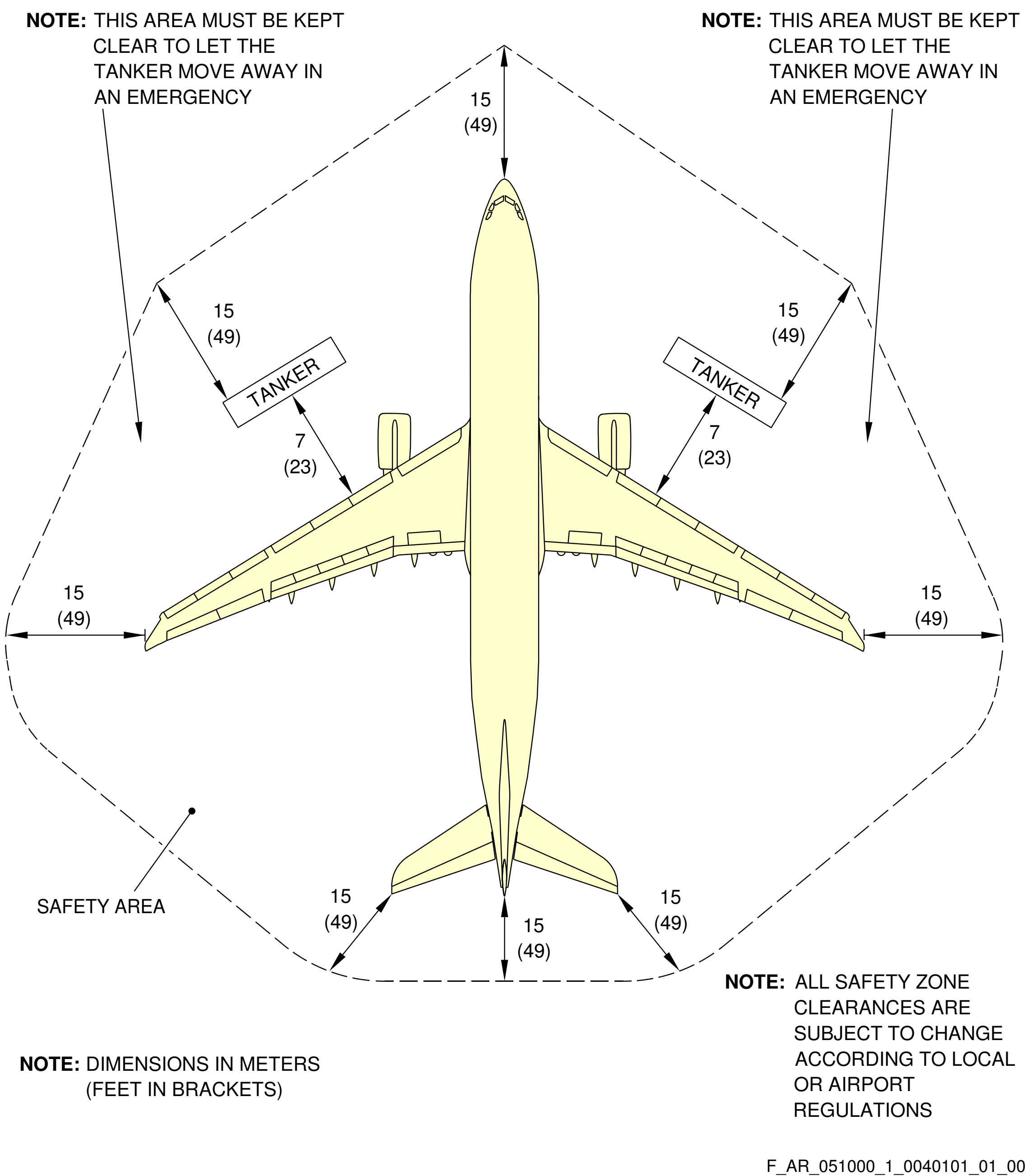
U. Immediately remove all fuel spillage in accordance with local procedures.

V. You have stopped all fuel leaks.

W. Trained personnel are available to contain all fuel spills.

X. If necessary put a GPU in position as far as practicable from the A/C. The GPU must have 3 phases, with 115 Volts AC, 400 Hz and 20 KVA.

**ON A/C A330-200 A330-300



Defuelling
Safety Area
FIGURE-05-10-00-991-004-A01

05-20 FUEL SYSTEM DESCRIPTION

05-20-00 FUEL SYSTEM DESCRIPTION

****ON A/C A330-200 A330-300**

DESC 05-20-00-001-A01

Fuel System Basic Description

1. Basic Description
   The fuel system:
   - controls and supplies fuel in the correct quantities to the fuel tanks during refuel operations,
   - supplies fuel to the engines via the engine feed tanks during flight,
   - supplies fuel to the Auxiliary Power Unit (APU),
   - moves fuel from the Trim tank (during flight) to control the Center of Gravity (CG) of the aircraft,
   - gives indications in the cockpit of system operation,
   - gives indications in the cockpit of a malfunction in the system that could cause an unusual condition,
   - controls defuel and fuel ground transfers.

   See DESC 09-10-12-004-A01 for the ground service connections (refuel/defuel coupling and refuel/defuel control panel).

**ON A/C A330-200 A330-300

DESC 05-20-00-002-A01

Tanks

1. The aircraft has the following fuel tanks:

Tank	Capacity	
	liters	US Gallons
Outer Tank LH	3 650	964
Outer Tank RH	3 650	964
Inner Tank LH	42 000	11 095
Inner Tank RH	42 000	11 095
Center Tank	41 560	10 979
Trim Tank	6 230	1 646
Total fuel capacity	139 090	36 744

Tank Capacities

TABLE 1

NOTE : Depending on A/C configuration, if the Center Tank is installed.

2. Each tank has one or more water drain valves. These are used to:
   - drain the water, which could possibly come out of the fuel in the tank
   - drain the fuel that remains after a defuel procedure has been completed (for maintenance).

**ON A/C A330-200

3. All of the fuel tanks are fueled/defueled through a standard twin 2.5 inch fuel coupling, located in each wing leading edge.

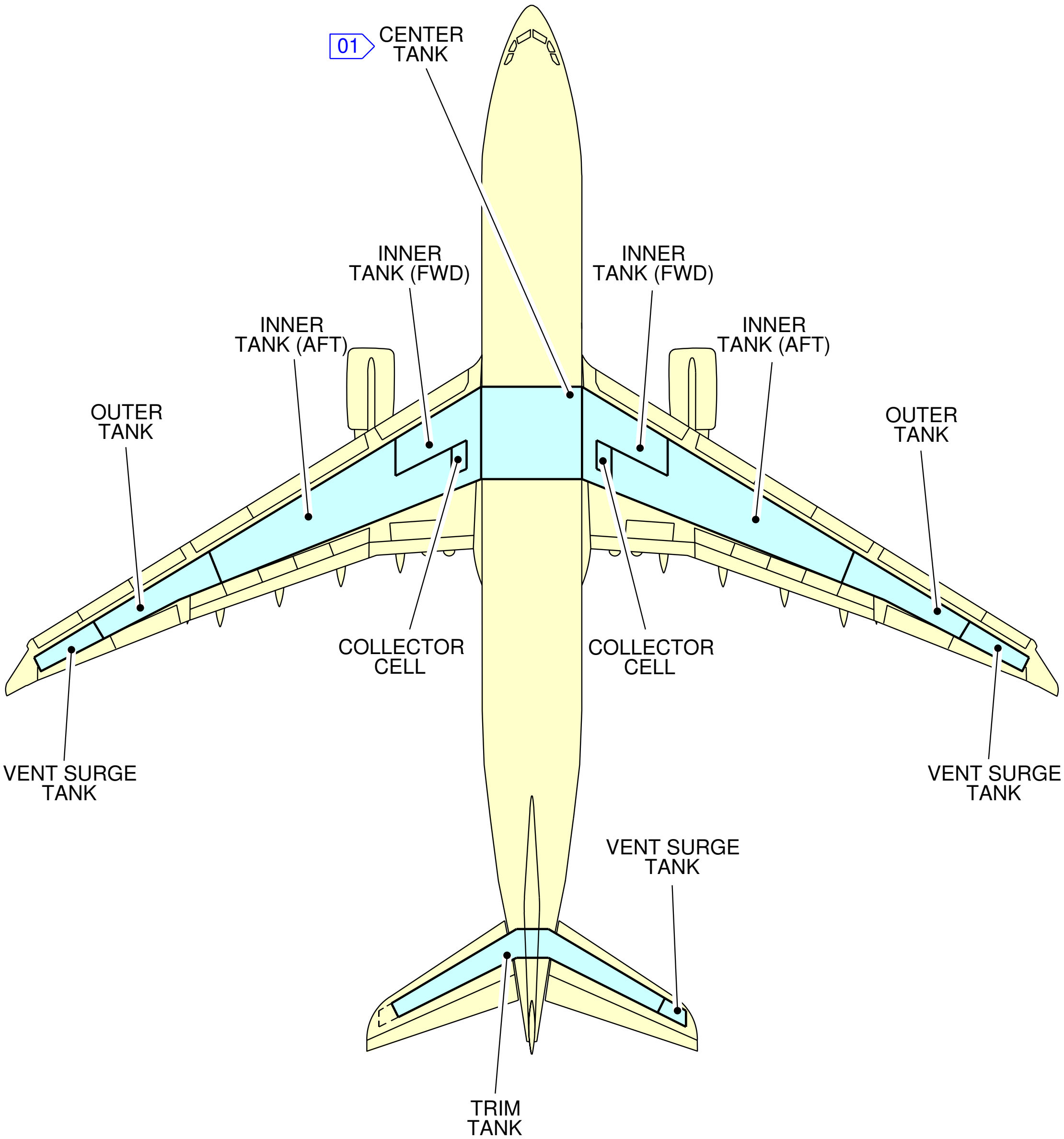
**ON A/C A330-300

4. All of the fuel tanks are fueled/defueled through a standard twin 2.5 inch fuel coupling, located in the right wing leading edge. A standard twin 2.5 inch fuel coupling can be installed in the left wing leading edge, depending on A/C configuration.

**ON A/C A330-200 A330-300

5. Each outer wing tank is vented through their vent surge tanks. The trim tank, in the horizontal stabilizer, has a vent surge tank in the right hand side only.
6. The main transfer system controls the flow of fuel from the center and the outer tanks to the inner tanks.
7. The system uses the fuel transfer-pump to move the fuel.
8. The FCMS (Fuel Control and Monitoring System) automatically controls the system, but if necessary, the system can be manually controlled in the cockpit. The trim transfer system controls the CG of the aircraft.
9. In flight, fuel is transferred to the inner tanks (Collector Cell) to make sure that the fuel supply to the engines is constant. There are tree fuel pumps in each collector cell, two main pumps and one standby pump. The main pumps supply fuel to their related engine. They can also supply fuel to the other engines if the related crossfeed valves is opened.

**ON A/C A330-200 A330-300



NOTE:
01 DEPENDING ON A/C CONFIGURATION

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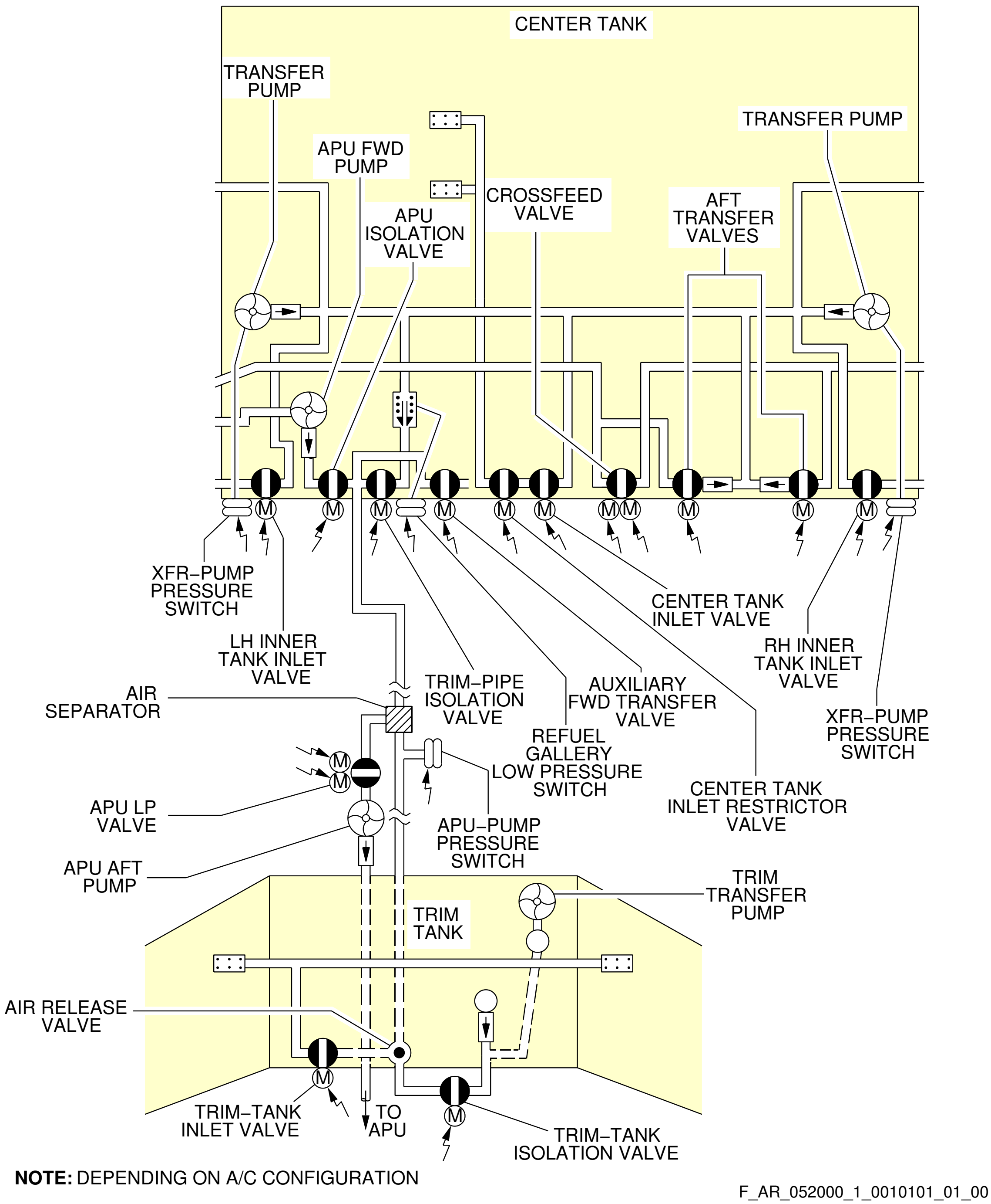
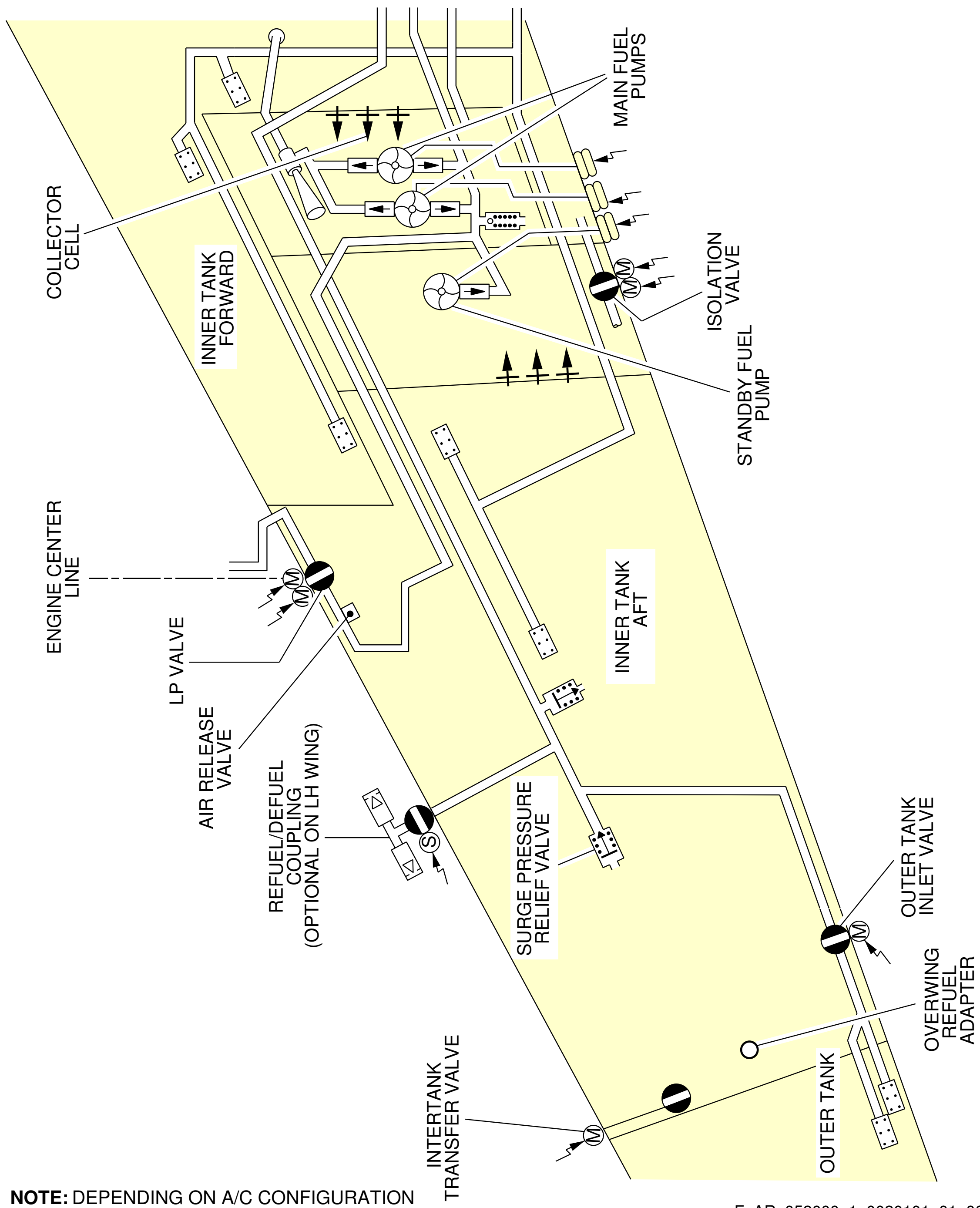
Fuel System
Fuel Tank General Arrangement
FIGURE-05-20-00-991-013-A01

**ON A/C A330-200 A330-300



Fuel System Schematic
Centre and Trim Tank
FIGURE-05-20-00-991-001-A01

**ON A/C A330-200 A330-300



Fuel System Schematic
Outer and Inner Tanks
FIGURE-05-20-00-991-002-A01

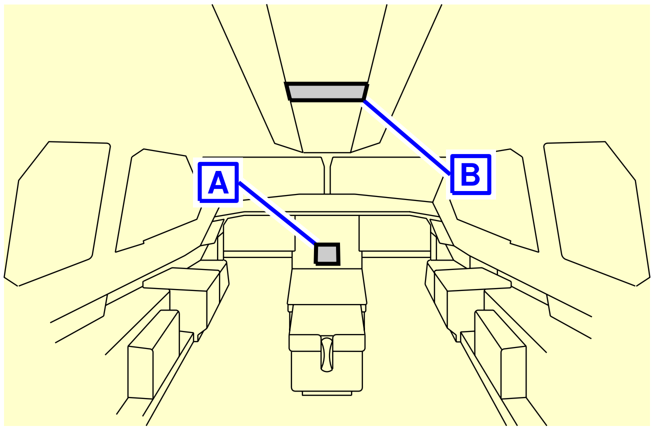
**ON A/C A330-200 A330-300

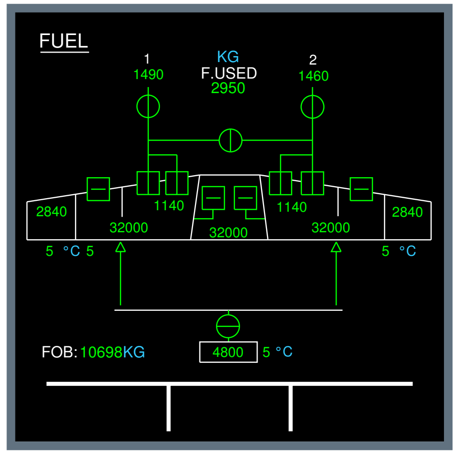
DESC 05-20-00-004-A01

Fuel Quantity Indicating System

1. The Fuel Quantity Indicating (FQI) system measures the total quantity of fuel in the fuel tanks. It gives indications for these areas:
   - The LH and RH outer tanks,
   - The LH and RH inner tanks, this includes the fuel in the collector cells,
   - The center tank, if installed,
   - The trim tank,
   - Fuel on board (FOB).
1. The Magnetic Level Indicator (MLI) provides a secondary method to measure the fuel quantity, see TASK 03-20-02-970-801-A01.

**ON A/C A330-200 A330-300





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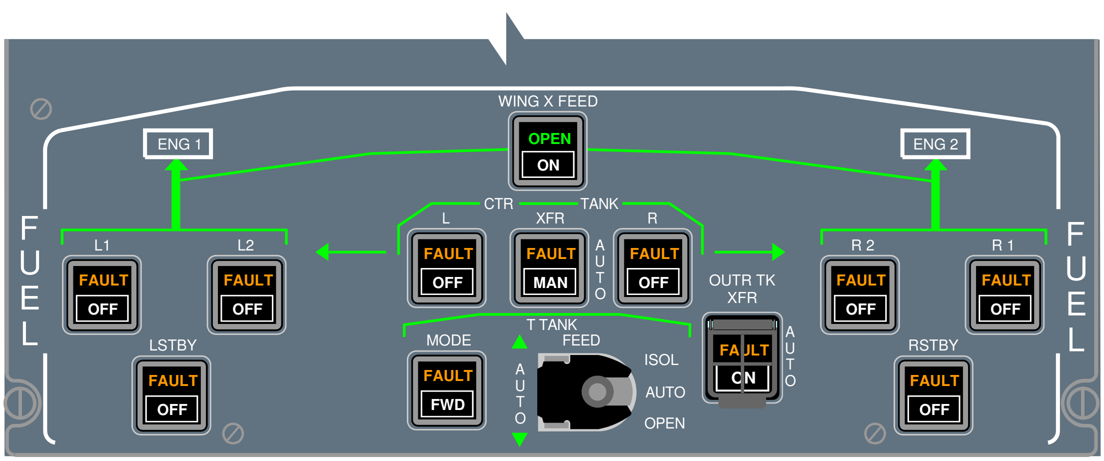

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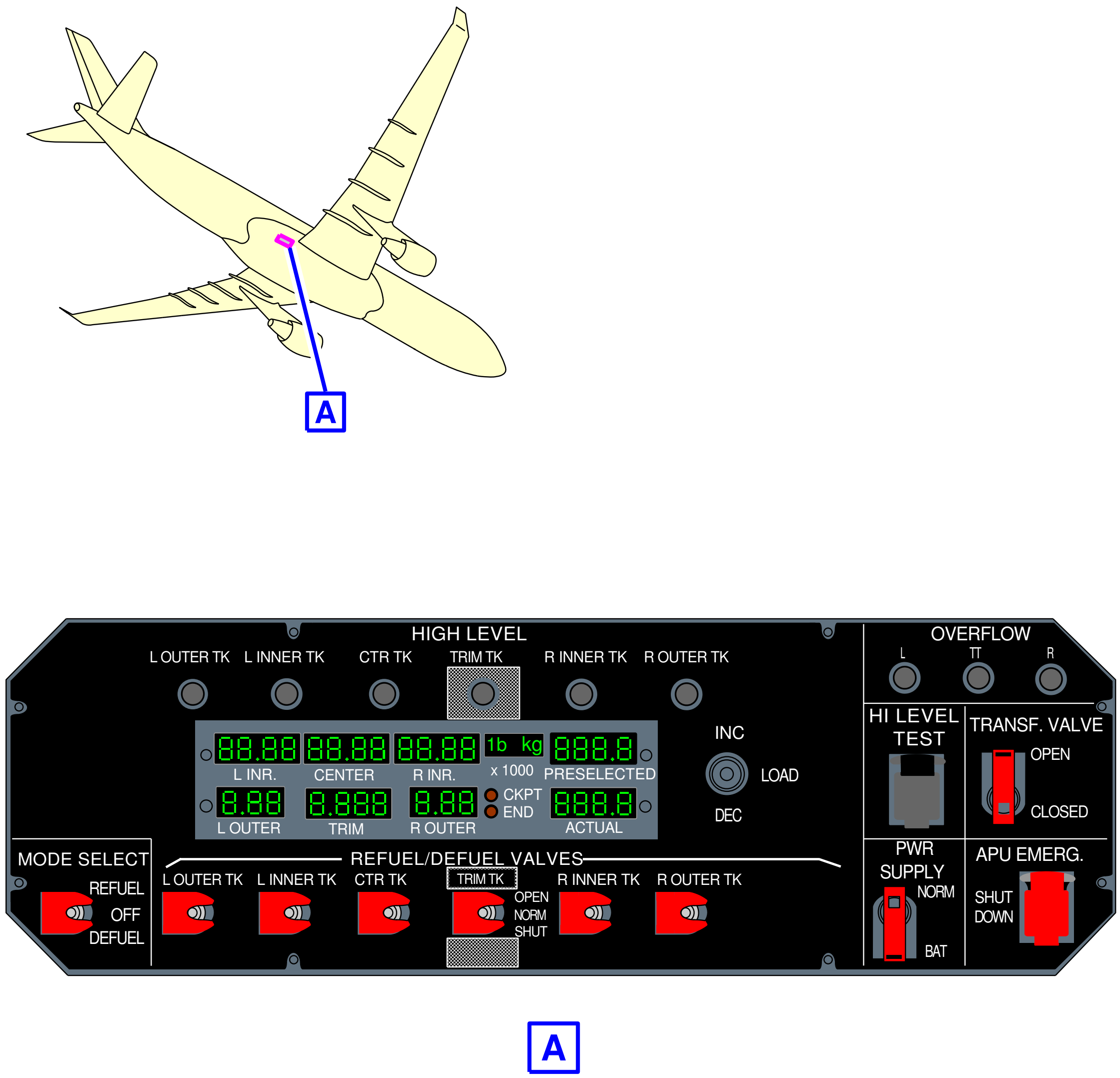
Fuel System
Control and Indications - Typical View
FIGURE-05-20-00-991-014-A01

**ON A/C A330-200 A330-300



NOTE: DEPENDING ON A/C CONFIGURATION

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Refuel/Defuel Control Panel
Typical View
FIGURE-05-20-00-991-015-A01

05-30 MOVING FUEL FOR CG CONTROL

05-30-00 MOVING FUEL FOR CG CONTROL

****ON A/C A330-200 A330-300**

TASK 05-30-00-650-801-A01

Ground Fuel Transfer Procedures

1. General

WARNING : MAKE SURE THAT ALL PERSONNEL IS AT A SAFE DISTANCE DURING THE REMOVAL OF FUEL, CARGO OR LARGE COMPONENTS. AN UNEQUAL REMOVAL OF FUEL OR CARGO OR THE REMOVAL OF LARGE COMPONENTS CAN CHANGE THE CG AND THE LONGITUDINAL AND LATERAL STABILITY OF THE AIRCRAFT. DEATH OR SERIOUS INJURY MAY RESULT IF THE AIRCRAFT FALLS ON RECOVERY PERSONNEL.

WARNING : MAKE SURE THAT YOU OBEY ALL THE APPLICABLE SAFETY PRECAUTIONS WHEN YOU REMOVE FUEL OR WHEN YOU WORK IN AN ENVIRONMENT WHERE THERE IS FUEL.

WARNING : DO NOT TRY TO GET ACCESS TO THE FUEL VALVE ACTUATORS IN A LANDING GEAR BAY IF THE RELATED GEAR IS RETRACTED AND THE GEAR DOORS ARE CLOSED. IN THIS CONDITION, THE WEIGHT OF THE LANDING GEAR CAN BE ON THE GEAR DOORS. IF YOU OPEN THESE GEAR DOORS, THERE IS A RISK THAT THE LANDING GEAR WILL EXTEND BY GRAVITY.

WARNING : MAKE SURE THAT THE AIRCRAFT IS STABLE AND SAFE BEFORE YOU TRY TO GET ACCESS TO THE FUEL SYSTEM VALVES OR OTHER COMPONENTS.

WARNING : THIS PROCEDURE IS FOR INFORMATION ONLY TO HELP YOU PREPARE THE RECOVERY OPERATION. TO DO THE PROCEDURE, YOU MUST REFER TO THE OPERATORS CUSTOMIZED DOCUMENTATION.

CAUTION : BEFORE YOU TRANSFER FUEL, MAKE SURE THAT THERE IS SUFFICIENT SPACE IN THE APPLICABLE TANKS FOR THE FUEL YOU WILL TRANSFER.

CAUTION : WITHOUT A SERVICEABLE ELECTRICAL SYSTEM, YOU MUST MONITOR THE QUANTITY OF FUEL IN THE TANKS AND MAKE SURE TO STOP THE TRANSFER TO A TANK WHEN THE FUEL IN THE TANK IS NEAR THE HIGH LEVEL QUANTITY.
THERE IS NO HIGH LEVEL PROTECTION FOR THE TANKS IF THE ELECTRICAL SYSTEM IS NOT SERVICEABLE.

If the aircraft is in a wing high position, it can be necessary to transfer fuel from the low wing to the high wing. This helps to move the aircraft lateral CG to the correct position.

Before you do a fuel transfer, you must find the fuel quantity in each fuel tank.

2. Inspections

Not Applicable.

3. Job Setup References

See DESC 05-10-00-001-A01 for general preparation before you start the transfer procedure.
See DESC 05-20-00-004-A01 for control panels and fuel quantity indicating system.
See AMM 28-25-00-869-801 for the customized procedure.

4. Job Set-up Information

A. Referenced Information

REFERENCE	DESIGNATION
DESC 05-10-00-001-A01	DESC 05-10-00-001-A01-General - Defueling
DESC 05-20-00-004-A01	DESC 05-20-00-004-A01-Fuel Quantity Indicating System
AMM 28-25-00-869-801	
AMM 12-11-28-650-801	
AMM 12-11-28-650-802	
AMM 24-41-00-861-801	
AMM 31-60-00-860-801	
AMM 27-40-00-866-801	

Referenced Information

TABLE 1

5. Procedure

Subtask 05-30-00-869-001-A01

A. Preparation

(1) Obey the fuel safety procedures when you work on the fuel system, see AMM 12-11-28-650-801 and AMM 12-11-28-650-802.

(2) Put safety barrier in position and a warning notice to tell persons not to operate the flight controls.

(3) Energize the aircraft electrical circuits, see AMM 24-41-00-861-801, and start the Electronic Instrument System (EIS), see AMM 31-60-00-860-801.

(4) Push the FUEL P/BSW and make sure that the Electronic Centralized Aircraft Monitoring (ECAM) System Display shows the FUEL page.

(5) If you want to do a ground fuel transfer from the trim tank with the APU in operation, set the THS to 0 degrees, see AMM 27-40-00-866-801.

(6) Open the access door 198DB.

(7) If it is necessary to lower the inner tank fuel level to 3 500 kg (7 716 lb) or less, do the procedure that follows.

NOTE : When the fuel quantity in the inner tank decreases to 3 500 kg (7 716 lb), the two intertank transfer valves open automatically. The fuel in the outer tanks then flows into the inner tanks.

(8) Get access to the avionics compartment. Then open, safety and tag circuit breakers FUEL MAIN XFR L and R.

(9) On the refuel/defuel panel 990VU:

(a) Lift the guard, then push and hold the HI LVL TEST switch. Make sure that:
- the hi-level lights and the OVERFLOW lights go to the opposite condition,
- the CKPT and END lights come on,
- the fuel quantity, PRESELECTED and ACTUAL displays show all 8's.

(b) Release the HI LVL TEST switch. Make sure that:
- the lights go back to their initial condition,
- the fuel quantity, PRESELECTED and ACTUAL displays go back to their initial condition.

(c) Make sure that the REFUEL-DEFUEL-VALVES switch(es) (of the tank(s) you want to move fuel from) are in the NORM and guarded position.

(d) Set the REFUEL/DEFUEL-VALVES switch(es) (of the tank(s) you want to move fuel into) to the OPEN position.

(e) Set the TRANSF VALVE switch to the OPEN position.

(f) Set the MODE SELECT switch to the REFUEL position.

Subtask 05-30-00-650-002-A01

B. Fuel Transfer

(1) To move some fuel from the LH (RH) inner tank:

(a) On the cockpit overhead panel 245VU:

1 Push the X FEED P/BSW. Make sure that:
- the ON and OPEN lights come on,
- the FUEL page shows the crossfeed valve symbol is in-line (valve open).

2 Push the L (R) INR TANK STBY P/BSW. Make sure that:
- the OFF lights go off,
- the FUEL page shows the standby-pump symbol is in-line (pump in operation).

(b) Continuously monitor the ground fuel-transfer.

(c) When the fuel contents are at the necessary level, release the L (R) INR TANK P/BSW. Make sure that:
- the OFF lights come on,
- the FUEL page shows the standby-pump symbol cross-line (pump not in operation).

(d) Release the X FEED P/BSW. Make sure that:
- the ON and OPEN lights go off,
- the FUEL page shows the crossfeed valve symbol cross-line (valve closed).

(2) To move all the fuel from the LH (RH) inner tank:

CAUTION : DO NOT LET THE FEED PUMPS OPERATE FOR MORE THAN FIFTEEN MINUTES WITH THE FAULT LIGHT ON. THIS PREVENTS DAMAGE TO THE FEED PUMPS.

(a) On the cockpit overhead panel 245VU:

1 Push the X FEED P/BSW. Make sure that:
- the ON and OPEN lights come on,
- the FUEL page shows the crossfeed valve symbol is in-line (valve open).

2 Push the L (R) INR TANK STBY P/BSW. Make sure that:
- the OFF lights go off,
- the FUEL page shows the standby-pump symbol is in-line (pump in operation).

(b) Operate the standby fuel pump until the L (R) INR TANK FAULT light come on.

(c) Release the L (R) INR TANK P/BSW. Make sure that:
- the OFF light comes on and the FAULT light goes off,
- the FUEL page shows the standby-pump symbol cross-line (pump not in operation).

(d) Release the X FEED P/BSW. Make sure that:
- the ON and OPEN lights go off,
- the FUEL page shows the crossfeed valve symbol cross-line (valve closed).

(3) To move some fuel from the center tank, if installed:

(a) Push the L and R CTR TK P/BSWs. Make sure that:
- the OFF lights go off,
- the FUEL page shows the L (R) CTR TK pump symbols are in-line (pumps in operation).

(b) Continuously monitor the ground fuel-transfer.

(c) When the fuel contents are at the necessary level, release the L (R) CTR TK P/BSWs. Make sure that:
- the OFF lights come on,

- the Fuel page shows the L (R) CTR TK pump symbols cross-line (pumps not in operation).

(4) To move all the fuel from the center tank, if installed:

CAUTION : DO NOT LET THE FEED PUMPS OPERATE FOR MORE THAN FIFTEEN MINUTES WITH THE FAULT LIGHT ON. THIS PREVENTS DAMAGE TO THE FEED PUMPS.

(a) Push the L and R CTR TK P/BSWs. Make sure that:
- the OFF lights go off,
- the FUEL page shows the L (R) CTR TK pump symbols are in-line (pumps in operation).

(b) Operate the pumps until the L and R CTR TANK FAULT lights come on.

(c) Release the L (R) CTR TK P/BSWs. Make sure that:
- the OFF lights come on,
- the FAULT light goes off,
- the FUEL page shows the L (R) CTR TK pump symbols cross-line (pumps not in operation).

(5) To move some fuel from the trim tank (Forward Transfer):

CAUTION : MAKE SURE THAT THERE IS SUFFICIENT SPACE IN THE CENTER TANK FOR THE FUEL FROM THE TRIM TANK. IF NECESSARY, DEFUEL THE CENTER TANK TO MAKE THE SPACE.

(a) Push the T TANK MODE P/BSW. Make sure that the FWD light comes on.

(b) The FUEL page shows:
- the trim-tank isolation valve symbol is in-line (valve open),
- the forward-transfer triangular symbol (fuel-transfer in operation).

(c) Monitor the fuel contents, and make sure that the trim tank figure decreases.

NOTE : During the forward transfer, the fuel from the trim tank goes into the center tank.

(d) When the fuel contents have decreased to the necessary level, release the T TANK MODE P/BSW. Make sure that:

1 the FWD light goes off,

2 the FUEL page shows:
- the trim-tank isolation valve symbol cross-line (valve closed),
- the forward-transfer triangular symbol is not in view (fuel-transfer is not in operation).

(e) Monitor the fuel contents on the FUEL page. Make sure that the trim tank indications become stable.

(f) To Move All of the Fuel from the Trim Tank (Forward Transfer)

1 Push the T TANK MODE P/BSW. Make sure that:

a the FWD light comes on,

b the FUEL page shows:
- the trim-tank isolation valve symbol is in-line (valve open),
- the forward-transfer triangular symbol (fuel-transfer in operation).

2 Monitor the fuel contents and make sure that the trim tank figure decreases.

3 Continue the forward transfer until the trim-tank fuel quantity indication is zero and the center-tank fuel quantity indication is stable.

4 Release the T TANK MODE P/BSW. Make sure that:

a the FWD light goes off,

b the FUEL page shows:
- the trim-tank isolation valve symbol cross-line (valve closed),
- the forward-transfer triangular symbol is not in view (fuel-transfer is not in operation).

(6) To move all the fuel from the trim tank (Forward Transfer):

CAUTION : MAKE SURE THAT THERE IS SUFFICIENT SPACE IN THE CENTER TANK FOR THE FUEL FROM THE TRIM TANK. IF NECESSARY, DEFUEL THE CENTER TANK TO MAKE THE SPACE.

(a) On the cockpit overhead panel 245VU, push the T TK XFR P/BSW. Make sure that:

1 the FWD light comes on,

2 the FUEL page shows:
- the trim-tank isolation valve symbol is in-line (valve open),
- the forward-transfer triangular symbol (fuel-transfer in operation).

(b) Monitor the fuel contents.

(c) Release the T TK XFR P/BSW. Make sure that:

1 the FWD light goes off,

2 the FUEL page shows:
- the trim-tank isolation valve symbol cross-line (valve closed),
- the forward-transfer triangular symbol is not in view (fuel-transfer is not in operation).

(d) Monitor the fuel contents on the FUEL page. Make sure that the trim tank indications become stable.

(7) To move fuel from the trim tank to the LH (RH) inner tank:

(a) On the MCDU Valves Test Page:
- make sure that all valves are closed,

- open the LH (RH) inner-tank inlet valve ("FUEL INR TK INLET VLV 1 (2)" on page 2),
- open the trim-pipe isolation valve ("FUEL TRIM LINE ISOL VLV" on page 4).

(b) Open the circuit breakers FUEL AUX FWD XFR and FUEL TRIMPIPE ISOL.
This is to make sure that the trim-pipe isolation valve stays open and the auxiliary forward-transfer valve stays closed.

(c) Push the T TANK MODE P/BSW. Make sure that:

1 the FWD light comes on,

2 the FUEL page shows:
- the trim-tank isolation valve symbol is in-line (valve open),
- the forward-transfer triangular symbol (fuel-transfer in operation).

NOTE : Ignore the indications of transfer to the center tank (if installed).

(d) Continue the forward transfer until the trim-tank fuel contents are at the necessary level and the LH (RH) inner-tank fuel quantity is stable.

(e) Release the T TANK MODE P/BSW. Make sure that:

1 the FWD light goes off,

2 the FUEL page shows:
- the trim-tank isolation valve symbol cross-line (valve closed),
- the forward-transfer triangular symbol is not in view (fuel-transfer is not in operation).

(f) Close the circuit breakers FUEL AUX FWD XFR and FUEL TRIMPIPE ISOL.

(g) On the MCDU Valves Test Page, make sure that all valves are closed.

(h) On the panel 261VU, open the reset button for FCMC1.

(i) On the panel 262VU, open the reset button for FCMC2 and wait for a minimum of 5 seconds.

(j) On the panel 261VU, close the reset button for FCMC1.

(k) On the panel 262VU, close the reset button for FCMC2 and wait for a minimum of 50 seconds.

05-40 DEFUEL SCENARIOS

05-40-00 DEFUEL SCENARIOS

****ON A/C A330-200 A330-300**

DESC 05-40-00-001-A01

Defuel Scenarios

1. You can use one of the procedures that follow to defuel the aircraft:
   A. Normal pressure defuel (with aircraft fuel pumps), with all systems serviceable, see TASK 05-40-01-650-801-A01.
   B. Suction defuel, with no electrical power available, see TASK 05-40-02-650-801-A01.
   C. Pressure defuel, using an External Wiring Harness (EWH) to supply power to the aircraft fuel pumps, see TASK 05-40-03-650-802-A01.
   D. Drain remaining fuel, see TASK 05-40-04-650-802-A01.

05-40-01 DEFUEL SCENARIO 1 NORMAL PRESSURE DEFUEL WITH ALL AIRCRAFT SYSTEMS SERVICEABLE

****ON A/C A330-200 A330-300**

TASK 05-40-01-650-801-A01

Normal Pressure Defuel With All Aircraft Systems Serviceable

1. General

WARNING : MAKE SURE THAT ALL PERSONNEL IS AT A SAFE DISTANCE DURING THE REMOVAL OF FUEL, CARGO OR LARGE COMPONENTS. AN UNEQUAL REMOVAL OF FUEL OR CARGO OR THE REMOVAL OF LARGE COMPONENTS CAN CHANGE THE CG AND THE LONGITUDINAL AND LATERAL STABILITY OF THE AIRCRAFT. DEATH OR SERIOUS INJURY MAY RESULT IF THE AIRCRAFT FALLS ON RECOVERY PERSONNEL.

WARNING : MAKE SURE THAT YOU OBEY ALL THE APPLICABLE SAFETY PRECAUTIONS WHEN YOU REMOVE FUEL OR WHEN YOU WORK IN AN ENVIRONMENT WHERE THERE IS FUEL.

WARNING : DO NOT SPILL FUEL ON THE ENGINES OR THE BRAKES. IF YOU SPILL FUEL ON ENGINES OR BRAKES THAT ARE HOT, IT CAN CAUSES FIRE.

WARNING : MAKE SURE THAT THE AIRCRAFT CENTER OF GRAVITY STAYS CORRECT WHEN YOU DEFUEL THE AIRCRAFT. YOU MUST MONITOR THE AIRCRAFT CG AT ALL TIMES.

WARNING : BEFORE YOU DO THIS PROCEDURE, MAKE SURE THAT THE AIRCRAFT ELECTRICAL SYSTEM IS DE-ENERGIZED AND ISOLATED.

CAUTION : KEEP THE BALANCE OF THE AIRCRAFT CORRECT WHEN YOU DEFUEL IT. YOU MUST DEFUEL THE TRIM TANK BEFORE YOU DEFUEL THE WING TANKS. WHEN IT IS POSSIBLE, DEFUEL THE TANKS EQUALLY.

You can use this procedure when the aircraft fuel pumps and the electrical systems are serviceable. But only use this procedure when there is no structural damage and all systems are serviceable. You cannot do the pressure defuel procedure if a surge tank level sensor is wet. This is shown when the indicator(s) light OVERFLOW on the refuel/defuel panel 990VU is(are) on. When a surge tank level sensor is wet you must do the suction defuel procedure, see TASK 05-40-02-650-801-A01.

2. Inspections
Not Applicable.

3. Job Setup References
See DESC 05-10-00-001-A01 for general preparation before you start the defuel procedure.
See DESC 05-20-00-004-A01 and DESC 09-10-12-004-A01 for the fuel system control panels and ground service connections.

See AMM 28-25-00-650-801 for the customized procedure.

4. Job Set-up Information

A. Referenced Information

REFERENCE	DESIGNATION
TASK 05-40-02-650-801-A01	TASK 05-40-02-650-801-A01-Suction Defuel Procedures When No Electrical Power Is Available
DESC 05-10-00-001-A01	DESC 05-10-00-001-A01-General - Defueling
DESC 05-20-00-004-A01	DESC 05-20-00-004-A01-Fuel Quantity Indicating System
DESC 09-10-12-004-A01	DESC 09-10-12-004-A01-Fuel System
AMM 28-25-00-650-801	
AMM 24-41-00-861-801	
AMM 27-40-00-866-801	
AMM 28-51-00-740-803	

Referenced Information

TABLE 1

5. Procedure

Subtask 05-40-01-869-001-A01

A. Preparation

(1) Make sure that the aircraft and the tanker are correctly grounded and bonded.

(2) Put access platforms and safety barriers in position.

(3) Open the access door 198DB to the refuel/defuel panel 990VU.

(4) Remove the applicable refuel coupling cap.

(5) Make sure that the hose-coupling of the fuel tanker/pump is clean.

(6) Make sure that there is no damage on the refuel/defuel coupling. In case of any damage, contact AIRBUS.

(7) Connect the hose-coupling of the fuel tanker/pump to the A/C refuel/defuel coupling.

NOTE : You can use 1, 2, 3 or 4 defuel hoses to do a pressure defuel. But when only one refuel/defuel adaptor (on a refuel/defuel coupling) is used, it must be the one identified with "USE THIS ADAPTOR TO DEFUEL".

(8) Energize the A/C electrical circuits, see AMM 24-41-00-861-801.

(9) In the cookpit:

(a) Start the ECAM system.

(b) On the ECAM Control Panel, push the FUEL P/BSW and make sure that ECAM System Display Unit shows the FUEL page.

(c) Read and make a record of the fuel quantities.

(10) If you want to fully defuel the trim tank, set the Trimmable Horizontal Stabilizer to 0 degrees, see AMM 27-40-00-866-801.

(11) On the Refuel/Defuel Control Panel 990VU:

(a) Make sure that the REFUEL-DEFUEL-VALVES switches are in the NORM and guarded position.

(b) Set the MODE SELECT switch to DEFUEL position.

(c) Set the TRANSF VALVE switch to OPEN position.

Subtask 05-40-01-650-003-A01

B. Pressure Defuel Procedure

WARNING : THIS PROCEDURE IS FOR INFORMATION ONLY TO HELP YOU PREPARE THE RECOVERY OPERATION. TO DO THE PROCEDURE, YOU MUST REFER TO THE OPERATORS CUSTOMIZED DOCUMENTATION.

(1) Defuel of the Center Tank, if installed:

(a) Defuel of the center tank to a lower quantity:

1 On the Fuel Control Panel 245VU, push the L and R CTR TANK P/BSWs. Make sure that:
- the OFF lights go off,
- on the ECAM the FUEL page shows the L and R CTR TANK fuel pump symbols are in-line (pumps in operation).

2 Monitor the fuel contents on the FUEL page.

3 When the fuel contents have decreased to the necessary level, release the L and R CTR TANK P/BSWs. Make sure that:
- the OFF lights come on,
- the FUEL page shows the L and R CTR TANK fuel pump symbols are cross-line (pumps not in operation).

4 Monitor the fuel contents indications on the FUEL page. Make sure that the indications become stable. Read and make a record of the fuel quantities.

(b) Defuel of the center tank until empty:

CAUTION : DO NOT LET THE FEED PUMPS OPERATE FOR MORE THAN FIFTEEN MINUTES WITH THE FAULT LIGHT ON. THIS PREVENTS DAMAGE TO THE FEED PUMPS.

1 On the Fuel Control Panel 245VU, push the L and R CTR TANK P/BSWs. Make sure that:
- the OFF lights go off,

- the FUEL page shows the L and R CTR TANK fuel-pump symbols are in-line (pumps in operation).

2 Operate the L and R CTR TANK pumps until a pump FAULT light comes on.

3 Release the related CTR TANK P/BSW. Make sure that:
- the OFF light comes on,
- the FAULT light goes off,
- the FUEL page shows the related CTR TANK fuel pump symbol is cross-line (pump not in operation).

4 Do this operation for the other pump.

(2) Defuel of the Trim Tank:

NOTE : The trim tank and the center tank, if installed, can be defueled at the same time.

(a) Defuel of the trim tank to a lower quantity:

1 On the Fuel Control Panel 245VU, push the T TANK MODE P/BSW. Make sure that:

a The FWD light comes on.

b The FUEL page shows:
- the trim-tank isolation valve symbol is in-line (valve open),
- the forward-transfer triangular symbol (fuel-transfer in operation).

2 Monitor the fuel contents.

3 When the fuel contents have decreased to the necessary level, release the T TANK MODE P/BSW. Make sure that:

a The FWD light goes off.

b The FUEL page shows:
- the trim-tank isolation valve symbol is cross-line (valve closed),
- the forward-transfer triangular symbol (fuel-transfer is not in operation).

4 Monitor the fuel contents on the FUEL page. Make sure that the trim tank indications become stable. Read and make a record of the fuel quantities.

(b) Defuel of the trim tank and the trim pipe until empty:

1 On the Fuel Control Panel 245VU, push the T TANK MODE P/BSW. Make sure that:

a The FWD light comes on.

b The FUEL page shows:
- the trim-tank isolation valve symbol is in-line (valve open),
- the forward-transfer triangular symbol (fuel-transfer in operation).

2 Monitor the fuel contents.

3 Continue the defuel until the defuel stops.

4 If it is necessary to defuel the wing tanks, put the T TANK FEED switch to the OPEN position for five minutes.

5 Make sure that the trim-tank fuel quantity indication is zero and the related tank fuel quantity indication is stable.

6 Release the T TANK MODE P/BSW and, if necessary, put the T TANK FEED switch to the AUTO position. Make sure that:

a The FWD light goes off.

b The FUEL page shows:
- the trim-tank isolation valve symbol is cross-line (valve closed),
- the forward-transfer triangular symbol is not in view (fuel-transfer not in operation).

(3) Defuel of the Wing Tanks:

(a) Defuel of the wing tanks to a lower quantity:

NOTE : You can defuel the wing tanks and the center tank, if installed, at the same time if the trim tank is empty. The Fuel Control and Monitoring System (FCMS) prevents movement of fuel from the wing tanks until the trim tank is empty.

1 On the Fuel Control Panel 245VU, push the L STBY and the R STBY switches to start the pumps. Make sure that:
- the OFF lights go off,
- the FUEL page shows that the related fuel pump symbol is in-line (pump in operation).

2 Monitor the fuel contents on the FUEL page.

NOTE : When the fuel quantity in one of the inner tanks decreases to 3 500 kg (7 716 lb) the two intertank transfer valves open. Fuel from the outer tanks then flows into the inner tanks.

3 When the fuel contents have decreased to the necessary level, release the L STBY the R STBY P/BSWs. Make sure that:
- the related pump P/BSW OFF light comes on,
- the FUEL page shows the related fuel pump symbol is cross-line (pump not in operation).

4 Monitor the fuel contents indications on the FUEL page. Make sure that the indications become stable. Read and make a record of the fuel quantities.

(b) Defuel of the wing tanks until empty:

CAUTION : DO NOT LET THE FEED PUMPS OPERATE FOR MORE THAN FIFTEEN MINUTES WITH THE FAULT LIGHT ON. THIS PREVENTS DAMAGE TO THE FEED PUMPS.

1 Push the L1, R1, L STBY and the R STBY P/BSWs. Make sure that:
- the OFF light goes off,
- the FUEL page shows the related fuel pump symbol is in-line (pump in operation).

2 Monitor the fuel quantity in the collector cells and do the steps that follow:

a When the fuel level in the collector cell is approximately 500 kg (1 100 lb), put the TRANS. VALVE switch to CLOSED.

NOTE : During a defuel, the fuel pump can empty the collector cell faster than the collector cell can fill. Thus you must let the collector cell fill again before the defuel can continue.

b When the collector cell is full again, put the TRANS. VALVE switch to OPEN.

c Do these steps again until the inner tank indication is zero.

3 Operate the pumps until a pump FAULT-light comes on.

4 Release the related TANK P/BSW. Make sure that:
- the related FAULT light goes off,
- the related pump P/BSW OFF light comes on - the FUEL page shows the related fuel pump symbol is cross-line (pump not in operation).

05-40-02 DEFUEL SCENARIO 2 SUCTION DEFUEL WHEN NO ELECTRICAL POWER AVAILABLE

ON A/C A330-200 A330-300

TASK 05-40-02-650-801-A01

Suction Defuel Procedures When No Electrical Power Is Available

1. General

WARNING : MAKE SURE THAT ALL PERSONNEL IS AT A SAFE DISTANCE DURING THE REMOVAL OF FUEL, CARGO OR LARGE COMPONENTS. AN UNEQUAL REMOVAL OF FUEL OR CARGO OR THE REMOVAL OF LARGE COMPONENTS CAN CHANGE THE CG AND THE LONGITUDINAL AND LATERAL STABILITY OF THE AIRCRAFT. DEATH OR SERIOUS INJURY MAY RESULT IF THE AIRCRAFT FALLS ON RECOVERY PERSONNEL.

WARNING : MAKE SURE THAT YOU OBEY ALL THE APPLICABLE SAFETY PRECAUTIONS WHEN YOU REMOVE FUEL OR WHEN YOU WORK IN AN ENVIRONMENT WHERE THERE IS FUEL.

WARNING : DO NOT SPILL FUEL ON THE ENGINES OR THE BRAKES. IF YOU SPILL FUEL ON ENGINES OR BRAKES THAT ARE HOT, IT CAN CAUSES FIRE.

WARNING : MAKE SURE THAT THE AIRCRAFT CENTER OF GRAVITY STAYS CORRECT WHEN YOU DEFUEL THE AIRCRAFT. YOU MUST MONITOR THE AIRCRAFT CG AT ALL TIMES.

WARNING : BEFORE YOU DO THIS PROCEDURE, MAKE SURE THAT THE AIRCRAFT ELECTRICAL SYSTEM IS DE-ENERGIZED AND ISOLATED.

CAUTION : KEEP THE BALANCE OF THE AIRCRAFT CORRECT WHEN YOU DEFUEL IT. YOU MUST DEFUEL THE TRIM TANK BEFORE YOU DEFUEL THE WING TANKS. WHEN IT IS POSSIBLE, DEFUEL THE TANKS EQUALLY.

CAUTION : MAKE SURE THAT THE SUCTION PRESSURE IS NOT MORE THAN THE MAXIMUM DEFUEL PRESSURE OF - 0.75BAR (-11PSI).

This procedure can be used when electrical systems are not serviceable. But only use this procedure when there is no structural damage.

2. Inspections
Not applicable.

3. Job Setup References
See DESC 05-10-00-001-A01 for general preparation before you start the defuel procedure.
See DESC 05-20-00-002-A01 and FIGURE 05-40-02-991-004-A for the location of all the valves.

4. Job Set-up Information

A. Fixtures, Tools, Test and Support Equipment

REFERENCE	DESIGNATION
D97B00-003	MECHANICAL - ACTUATOR

Fixtures, Tools, Test and Support Equipment

TABLE 1

B. Referenced Information

REFERENCE	DESIGNATION
TASK 03-20-02-970-801-A01	TASK 03-20-02-970-801-A01-Use of Magnetic Level Indicators (MLI)
DESC 05-10-00-001-A01	DESC 05-10-00-001-A01-General - Defueling
DESC 05-20-00-002-A01	DESC 05-20-00-002-A01-Tanks
04-80-11	04-80-11-LANDING GEAR DOORS
AMM 28-25-52-000-802	
AMM 28-26-53-000-801	
AMM 28-25-27-000-801	
AMM 28-25-55-000-801	
AMM 28-27-52-000-802	
AMM 28-27-53-000-801	
AMM 28-29-51-000-801	
AMM 28-27-52-000-801	
AMM 28-25-57-000-802	
AMM 28-25-53-000-801	
AMM 28-25-57-000-801	
AMM 28-27-55-000-801	
AMM 28-25-57-000-803	
AMM 28-25-57-000-804	
AMM 28-25-59-000-801	
AMM 28-26-55-000-801	
FIGURE 05-40-02-991-004-A	FIGURE 05-40-02-991-004-A-Motor Actuator
FIGURE 05-40-02-991-004-A	FIGURE 05-40-02-991-004-A-Motor Actuator
FIGURE 05-40-02-991-001-A	FIGURE 05-40-02-991-001-A-Defuel

Referenced Information

TABLE 2

5. Procedure

Subtask 05-40-02-869-001-A01

A. Preparation

(1) Make sure that the aircraft and the tanker are correctly grounded and bonded.

(2) Put the access platforms and the safety barriers in position.

(3) Open the MLG doors, see 04-80-11, and the applicable access panels to have access at the refuel/defuel valves.

(4) Remove the applicable refuel coupling cap(s).

(5) Make sure that the hose-coupling(s) of the fuel tanker/pump is(are) clean.

(6) Make sure that there is no damage on the refuel/defuel coupling(s). In case of any damage, contact AIRBUS.

(7) Connect the tanker hose(s) to the refuel/defuel coupling(s).

(8) Use the Magnetic Level Indicators to calculate the quantity of the fuel from the tanks, see TASK 03-20-02-970-801-A01. Record the results.

(9) Record the position of the valves that follow, so that you can return them to their recorded position after the defuel:

- fuel inlet, trim tank, see AMM 28-25-52-000-802,
- fuel inlet, inner tanks, see AMM 28-26-53-000-801,
- fuel inlet, outer tanks, see AMM 28-25-27-000-801,
- auxiliary-forward fuel transfer, see AMM 28-25-55-000-801,
- trim tank isolation, see AMM 28-27-52-000-802,
- trim-pipe isolation, see AMM 28-27-53-000-801,
- APU isolation, see AMM 28-29-51-000-801.

(10) Remove the electrical actuators from the valves in paragraph .

<u>NOTE</u> : The fuel trim-tank isolation valve is used only if the transfer pipe to the trim-tank is to be defuelled.

(11) Install the D97B00-003 MECHANICAL - ACTUATOR on each valves in paragraph , see FIGURE 05-40-02-991-004-A.

(12) Manually set the valves in paragraph to the open position.

Subtask 05-40-02-650-002-A01

B. Suction Defuel When No Electrical Power Is Available

<u>CAUTION</u> : MAKE SURE THAT THE SUCTION PRESSURE IS NOT MORE THAN THE MAXIMUM DEFUEL PRESSURE OF - 0.75BAR (-11PSI).

(1) Start the suction pumps on the fuel tanker.

(2) Push and hold the Override Buttons on the Refuel/Defuel Isolation Valves, see FIGURE 05-40-02-991-001-A.

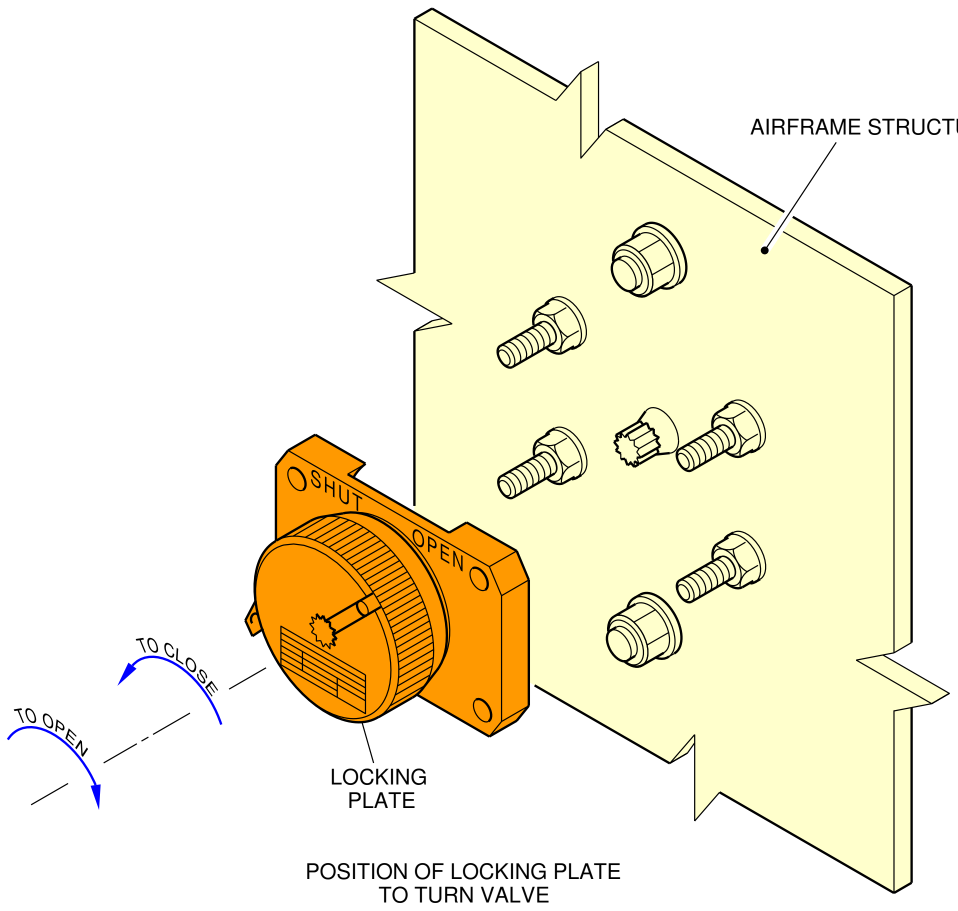
NOTE : The Override Buttons must be held in all the time the defuel is in progress.

(3) Use the MLIs to monitor the fuel contents in the tanks, see TASK 03-20-02-970-801-A01. You can also use the gauges in the tanker to monitor the fuel quantity removed.

(4) When each tank becomes empty, set the applicable fuel valve to the closed position.

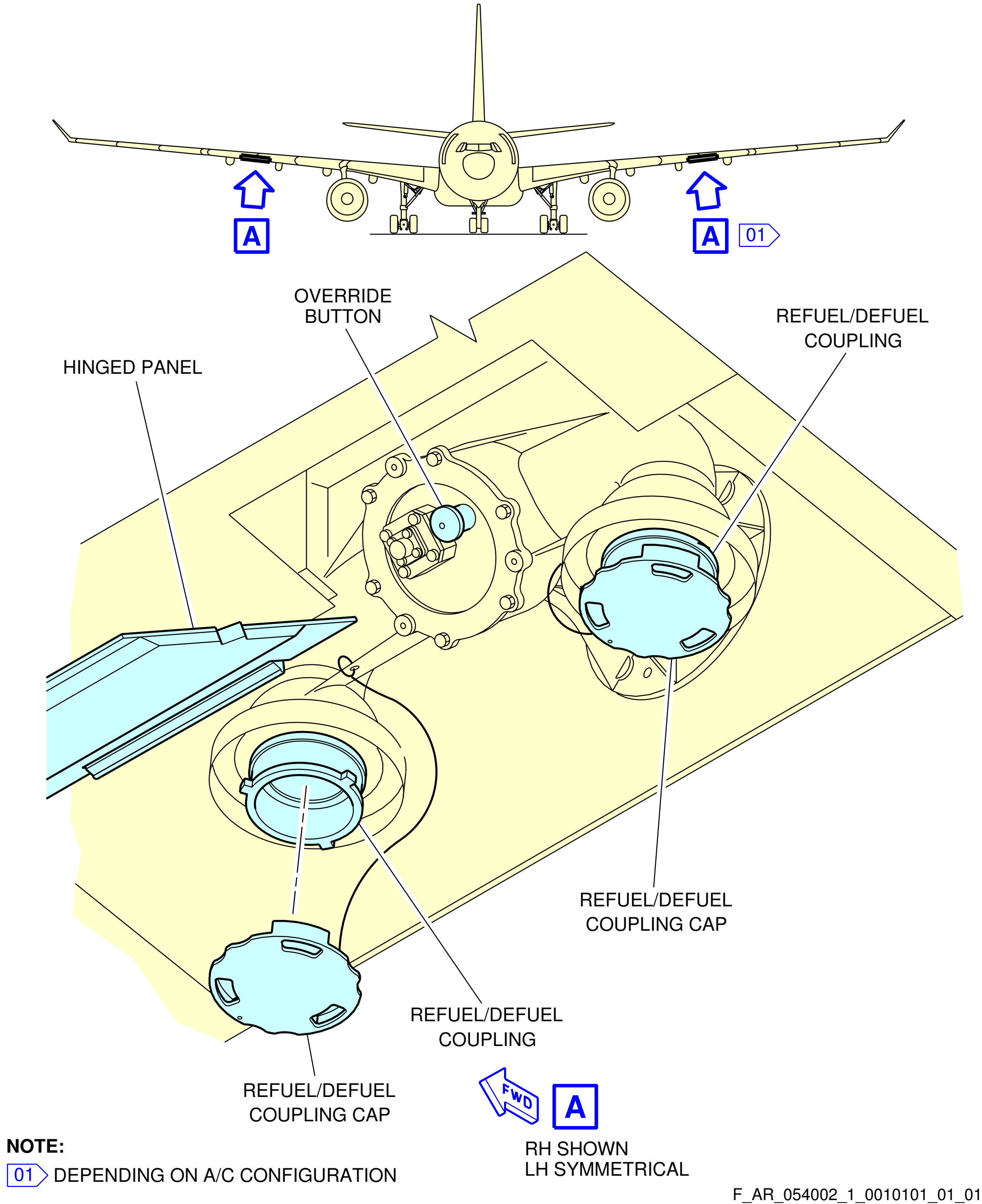
(5) When the defuel is complete you must:
- release the Override Buttons on the Refuel/Defuel Isolation Valves,
- stop the suction motors on the fuel tanker,
- return all the valves that you manually opened to the original positions,
- install the electrical actuators.

**ON A/C A330-200 A330-300



Motor Actuator
Operation of Locking Plate
FIGURE-05-40-02-991-004-A01

**ON A/C A330-200 A330-300



Defuel
Refuel/Defuel Couplings and Override Buttons
FIGURE-05-40-02-991-001-A01

05-40-03 DEFUEL SCENARIO 3 DEFUEL USING AN EXTERNAL WIRING HARNESS

**ON A/C A330-200 A330-300

TASK 05-40-03-650-802-A01

Defuel Using an External Wiring Harness

1. General

WARNING : MAKE SURE THAT ALL PERSONNEL IS AT A SAFE DISTANCE DURING THE REMOVAL OF FUEL, CARGO OR LARGE COMPONENTS. AN UNEQUAL REMOVAL OF FUEL OR CARGO OR THE REMOVAL OF LARGE COMPONENTS CAN CHANGE THE CG AND THE LONGITUDINAL AND LATERAL STABILITY OF THE AIRCRAFT. DEATH OR SERIOUS INJURY MAY RESULT IF THE AIRCRAFT FALLS ON RECOVERY PERSONNEL.

WARNING : MAKE SURE THAT YOU OBEY ALL THE APPLICABLE SAFETY PRECAUTIONS WHEN YOU REMOVE FUEL OR WHEN YOU WORK IN AN ENVIRONMENT WHERE THERE IS FUEL.

WARNING : DO NOT SPILL FUEL ON THE ENGINES OR THE BRAKES. IF YOU SPILL FUEL ON ENGINES OR BRAKES THAT ARE HOT, IT CAN CAUSES FIRE.

WARNING : MAKE SURE THAT THE AIRCRAFT CENTER OF GRAVITY STAYS CORRECT WHEN YOU DEFUEL THE AIRCRAFT. YOU MUST MONITOR THE AIRCRAFT CG AT ALL TIMES.

WARNING : BEFORE YOU DO THIS PROCEDURE, MAKE SURE THAT THE AIRCRAFT ELECTRICAL SYSTEM IS DE-ENERGIZED AND ISOLATED.

CAUTION : KEEP THE BALANCE OF THE AIRCRAFT CORRECT WHEN YOU DEFUEL IT. YOU MUST DEFUEL THE TRIM TANK BEFORE YOU DEFUEL THE WING TANKS. WHEN IT IS POSSIBLE, DEFUEL THE TANKS EQUALLY.

This procedure can be used when electrical systems cannot be energized, but it is possible to supply power to the pumps directly through a GPU. Use this procedure only when there is no structural damage.

2. Inspections

Not applicable.

3. Job Setup References

See DESC 05-10-00-001-A01 for general preparation before you start the defuel procedure.
See DESC 05-20-00-002-A01 for a Fuel System Schematic showing the location of all the valves and pumps.
See 05-40-02 for locking plate of the refuel valves D97B00-003 MECHANICAL - ACTUATOR and for the override buttons.

4. Job Set-up Information

A. Referenced Information

REFERENCE	DESIGNATION
DESC 05-10-00-001-A01	DESC 05-10-00-001-A01-General - Defueling
DESC 05-20-00-002-A01	DESC 05-20-00-002-A01-Tanks
05-40-02	05-40-02-DEFUEL SCENARIO 2 SUCTION DEFUEL WHEN NO ELECTRICAL POWER AVAILABLE
04-80-11	04-80-11-LANDING GEAR DOORS
02-30-01	02-30-01-LANDING GEAR
AMM 28-25-52-000-802	
AMM 28-26-53-000-801	
AMM 28-25-27-000-801	
AMM 28-25-57-000-802	
AMM 28-25-55-000-801	
AMM 28-27-53-000-801	
AMM 28-27-52-000-801	
AMM 28-25-53-000-801	
AMM 28-25-57-000-801	
AMM 28-27-55-000-801	
AMM 28-29-51-000-801	
AMM 28-27-54-000-801	
AMM 28-25-57-000-803	
AMM 28-25-57-000-804	
AMM 28-25-59-000-801	
AMM 28-26-55-000-801	

Referenced Information

TABLE 1

5. Procedure

Subtask 05-40-03-869-001-A01

A. Preparation

(1) Make sure that the aircraft electrical system is de-energized and isolated.

(2) Make sure that there is no GPU connected to the aircraft electrical system.

(3) Make sure that the aircraft and the tanker are correctly grounded and bonded.

(4) Put the access platforms and the safety barriers in position.

(5) Remove the applicable refuel coupling cap(s).

(6) Make sure that the hose-coupling(s) of the fuel tanker/pump is(are) clean.

(7) Make sure that there is no damage on the A/C refuel/defuel coupling(s). In case of any damage, contact AIRBUS.

(8) Connect the tanker hose(s) to the A/C refuel/defuel coupling(s).

(9) Open the MLG doors, see 04-80-11, and the applicable access panels to have access at the refuel/defuel valves. See DESC 05-20-00-002-A01 for the location of all valves.

(10) Record the positions of the valves that follow, so that you can return them to their recorded position after the defuel:
- fuel inlet, trim tank, see AMM 28-25-52-000-802,
- fuel inlet, inner tanks, see AMM 28-26-53-000-801,
- fuel inlet, outer tanks, see AMM 28-25-27-000-801,
- fuel inlet, center tank, if installed, see AMM 28-25-57-000-802,
- fuel, auxiliary forward transfer, see AMM 28-25-55-000-801,
- fuel, trim pipe isolation, center section, see AMM 28-27-53-000-801.

(11) Remove the electrical actuators from these valves from paragraph .

(12) Manually set the valves from paragraph to the closed position.

(13) If necessary, set these valves to OPEN:
- fuel, crossfeed,
- fuel, trim tank isolation.

NOTE : The fuel crossfeed valve will allow you to defuel the complete aircraft from one wing. That is from either the LH wing or the RH wing refuel/defuel couplings. When you open the fuel trim pipe isolation valve, you can remove the fuel from the transfer pipe.

Subtask 05-40-03-650-001-A01

B. Defuel Procedures Using an External Wiring Harness

(1) Disconnect the electrical actuators from the LH and RH STBY fuel pumps.

(2) Connect the External Wiring Harness (EWH) to LH and RH STBY fuel pumps.

NOTE : You can control the pumps from the switches on the EWH control panel.

(3) Push and hold in the override button on the refuel/defuel isolation valves.

NOTE : The override buttons must be held in all the time the defuel is in progress.

(4) To defuel the trim tank:

(a) Manually set these valves to OPEN:
- fuel, trim tank isolation,
- fuel, auxiliary FWD transfer.

(b) On the control panel of the EWH, set the pump switches to ON.

(c) Push and hold in the override buttons on the refuel/defuel isolation valves

(d) Monitor the fuel quantity received at the tanker until the trim tank is empty.

NOTE : There are no manual MLIs in the trim tank.
To monitor the fuel in the trim tank, you must record the fuel quantity that is received at the tanker.

(5) To defuel the outer tanks, then the inner tanks:

NOTE : The inner tank high level protection does not function without power. You must use the MLIs to monitor the fuel levels.

(a) Manually open the outer tank inlet valves.

CAUTION : DO NOT LET THE FEED PUMPS OPERATE FOR MORE THAN FIFTEEN MINUTES WITH THE FAULT LIGHT ON. THIS PREVENTS DAMAGE TO THE FEED PUMPS.

(b) On the control panel of the EWH, set the pump switches to ON.

(c) Push and hold in the override buttons on the refuel/defuel isolation valves.

(d) Monitor the fuel quantities in the outer tanks with the MLIs when the flow to the tanker has become stable.

(e) To complete the defuel the wings tanks, you must next remove the fuel from the inner tanks.

(f) Manually open the inner tank inlet valves.

(g) On the control panel of the EWH, set the pump switches to ON.

(h) Push and hold in the override buttons on the refuel/defuel isolation valves.

(i) Monitor the fuel quantities in all the tanks until they are empty.

NOTE : The aircraft MLIs can be used to give an indication of the fuel contents in the wing tanks.

(6) When the defuel is complete:

(a) Release the refuel/defuel isolation valves.

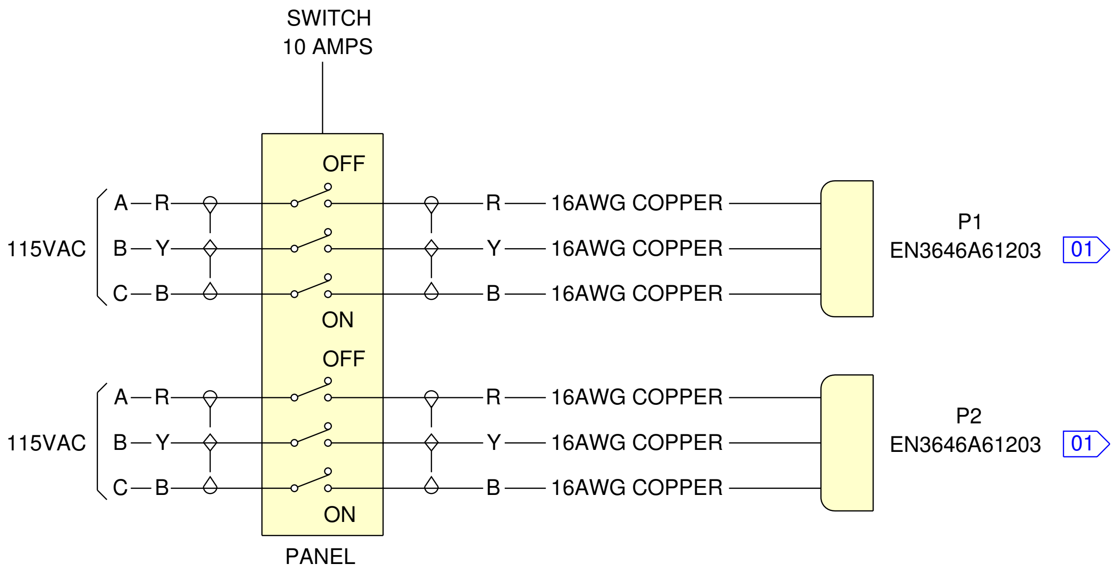
(b) Set all the fuel valves to their correct recorded position.

(c) Remove the EWH from the LH and RH STBY fuel pumps.

(d) Install the electrical actuators on these valves.

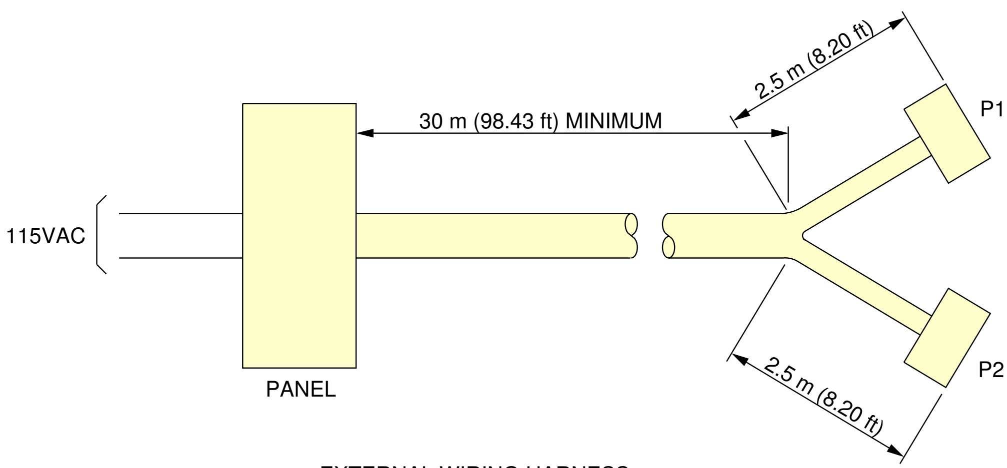
(e) Reconnect the electrical actuators to the left and right hand transfer pumps.

**ON A/C A330-200 A330-300



WIRING DIAGRAM EXTERNAL WIRING HARNESS

01 EN3646A61203FN: CONNECTOR WITH PINS
EN3646A61203BN: CONNECTOR WITHOUT PINS



EXTERNAL WIRING HARNESS

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Defuel Procedures Using an External Wiring Harness
External Wiring Harness
FIGURE-05-40-03-991-001-A01

05-40-04 DEFUEL SCENARIO 4 DRAIN REMAINING FUEL

****ON A/C A330-200 A330-300**

TASK 05-40-04-650-802-A01

Drain Remaining Fuel

1. General

WARNING : MAKE SURE THAT ALL PERSONNEL IS AT A SAFE DISTANCE DURING THE REMOVAL OF FUEL, CARGO OR LARGE COMPONENTS. AN UNEQUAL REMOVAL OF FUEL OR CARGO OR THE REMOVAL OF LARGE COMPONENTS CAN CHANGE THE CG AND THE LONGITUDINAL AND LATERAL STABILITY OF THE AIRCRAFT. DEATH OR SERIOUS INJURY MAY RESULT IF THE AIRCRAFT FALLS ON RECOVERY PERSONNEL.

WARNING : MAKE SURE THAT YOU OBEY ALL THE APPLICABLE SAFETY PRECAUTIONS WHEN YOU REMOVE FUEL OR WHEN YOU WORK IN AN ENVIRONMENT WHERE THERE IS FUEL.

WARNING : DO NOT SPILL FUEL ON THE ENGINES OR THE BRAKES. IF YOU SPILL FUEL ON ENGINES OR BRAKES THAT ARE HOT, IT CAN CAUSES FIRE.

This procedure can be used:
- To drain the fuel that remains in the fuel tanks,
- To defuel the aircraft when no other procedure can be done.

2. Inspections

Not applicable.

3. Job Setup References

See DESC 05-10-00-001-A01 for general preparation before you start the defuel procedure.
See DESC 09-10-12-004-A01 for the fuel system ground connections.
See AMM 28-25-00-650-803 for the customized procedure.
To do this procedure, you can use:
- 97A28002117002 PURGING TOOL for all tanks except the trim tank,
  or
- 98A28104000000 PURGING TOOL - WATER DRAIN for all tanks.

4. Job Set-up Information

A. Fixtures, Tools, Test and Support Equipment

REFERENCE	DESIGNATION
97A28002117002	PURGING TOOL

REFERENCE	DESIGNATION
98A28104000000	PURGING TOOL - WATER DRAIN

Fixtures, Tools, Test and Support Equipment

TABLE 1

B. Referenced Information

REFERENCE	DESIGNATION
DESC 05-10-00-001-A01	DESC 05-10-00-001-A01-General - Defueling
DESC 09-10-12-004-A01	DESC 09-10-12-004-A01-Fuel System
AMM 28-25-00-650-803	
FIGURE 05-40-04-991-002-A	FIGURE 05-40-04-991-002-A-Drain Remaining Fuel

Referenced Information

TABLE 2

5. Procedure

Subtask 05-40-04-481-001-A01

A. Preparation

(1) Make sure that the aircraft electrical system is de-energized and isolated.

(2) Make sure that the aircraft and the tanker are correctly grounded and bonded.

(3) Put access platforms and safety barriers in position.

Subtask 05-40-04-650-002-A01

B. Drain Fuel Procedure

WARNING : THIS PROCEDURE IS FOR INFORMATION ONLY TO HELP YOU PREPARE THE RECOVERY OPERATION. TO DO THE PROCEDURE, YOU MUST REFER TO THE OPERATORS CUSTOMIZED DOCUMENTATION.

NOTE : For the trim tank procedure, see SUBTASK 05-40-04-650-004-A01.

(1) For gravity draining fuel procedure:

(a) Attach the hose to the 97A28002117002 PURGING TOOL, see FIGURE 05-40-04-991-002-A.

(b) Put the end of the hose into the container.

(c) On the 97A28002117002 PURGING TOOL, fully retract the nut (4), the screw (3) and the plunger (1).

(d) Put the hexagonal end of the bush (2) into the bottom of the water drain valve, see FIGURE 05-40-04-991-002-A.

(e) Turn the bush through 30 degrees clockwise.

(f) Turn the nut (4) until it touches and seals against the aircraft skin.

(g) Hold the bush (2) and turn the screw (3) clockwise to its stop. This causes the plunger (1) to open the drain valve and the fuel to flow.

(h) Continuously monitor the fuel flow into the container. Make sure that there is sufficient space in the container for all of the drained fuel. Replace the container as necessary.

(i) Continue the draining procedure until no fuel flows.

(j) When no fuel flows, turn the screw (3) counter-clockwise to its stop.

(k) Turn nut (4) until it does not touch the aircraft skin.

(l) Turn the hexagonal end of the bush (2) 30 degrees and remove the 97A28002117002 PURGING TOOL and the container(s).

(m) Repeat the steps in paragraphs to for each tank to be drained.

(2) For suction draining fuel procedure:

NOTE : The illustration shows a typical suction pump with an air-drill power source. The suction pump used must be a type approved for use on a typical fuel system and the applicable safety precautions must be taken.

(a) Attach the hose to the 97A28002117002 PURGING TOOL, see FIGURE 05-40-04-991-002-A.

(b) Put the end of the hose into the container.

(c) On the 97A28002117002 PURGING TOOL, fully retract the nut (4), the screw (3) and the plunger (1).

(d) Put the hexagonal end of the bush (2) into the bottom of the water drain valve, see FIGURE 05-40-04-991-002-A.

(e) Turn the bush through 30 degrees clockwise.

(f) Turn the nut (4) until it touches and seals against the aircraft skin.

(g) Connect the end of the drain hose to the inlet of the suction pump and a second hose to the outlet of the suction pump. Put the end of the second hose into the container.

(h) Hold the bush (2) and turn the screw (3) clockwise to its stop. This causes the plunger (1) to open the drain valve and the fuel to flow.

(i) Start the suction pump.

(j) Continuously monitor the fuel flow into the container. Make sure that there is sufficient space in the container for all of the drained fuel. Replace the container as necessary.

(k) Continue the suction draining procedure until no fuel flows.

(l) When no fuel flows, turn the screw (3) counter-clockwise to its stop.

(m) Turn nut (4) until it does not touch the aircraft skin.

(n) Turn the hexagonal end of the bush (2) 30 degrees and remove the 97A28002117002 PURGING TOOL and the container(s).

Subtask 05-40-04-650-004-A01

C. Drain Fuel Procedure of the Trim Tank

WARNING : THIS PROCEDURE IS FOR INFORMATION ONLY TO HELP YOU PREPARE THE RECOVERY OPERATION. TO DO THE PROCEDURE, YOU MUST REFER TO THE OPERATORS CUSTOMIZED DOCUMENTATION.

(1) For gravity draining fuel procedure:

(a) Attach the hose to the 98A28104000000 PURGING TOOL - WATER DRAIN, see FIGURE 05-40-04-991-002-A.

(b) Put the other end of the hose into the container.

(c) Install the 98A28104000000 PURGING TOOL - WATER DRAIN on the applicable water drain valve, see FIGURE 05-40-04-991-002-A.

(d) Hold the 98A28104000000 PURGING TOOL - WATER DRAIN in position and let the fuel flow.

(e) Continuously monitor the fuel flow into the container. Make sure that there is sufficient space in the container for all of the drained fuel. Replace the container as necessary.

(f) Continue the draining procedure until no fuel flows.

(g) When no fuel flows, remove the 98A28104000000 PURGING TOOL - WATER DRAIN and the container(s).

(h) Repeat the steps to for each trim tank water drain valve as applicable.

(2) For suction draining fuel procedure:

(a) Attach the hose to the 98A28104000000 PURGING TOOL - WATER DRAIN, see FIGURE 05-40-04-991-002-A.

(b) Put the other end of the hose into the container.

(c) Install the 98A28104000000 PURGING TOOL - WATER DRAIN on the applicable water drain valve, see FIGURE 05-40-04-991-002-A.

(d) Connect the end of the drain hose to the inlet of the suction pump and a second hose to the outlet of the suction pump. Put the end of the second hose into the container.

(e) Hold the 98A28104000000 PURGING TOOL - WATER DRAIN in position and let the fuel flow.

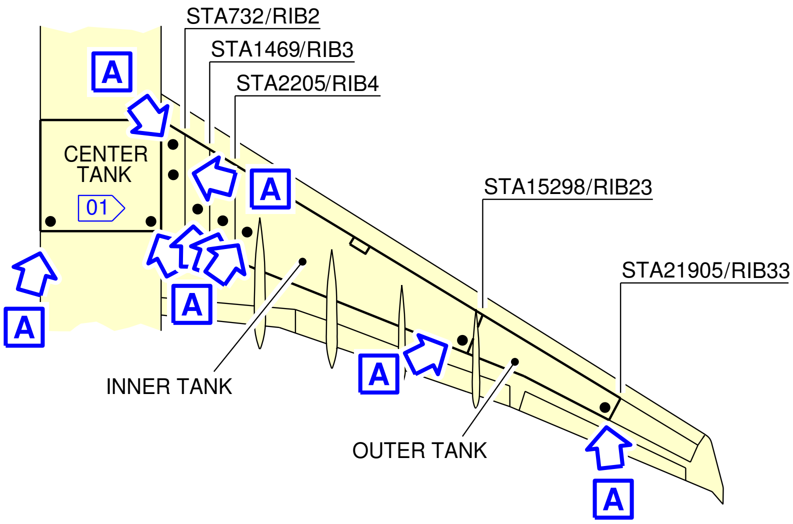
(f) Start the suction pump.

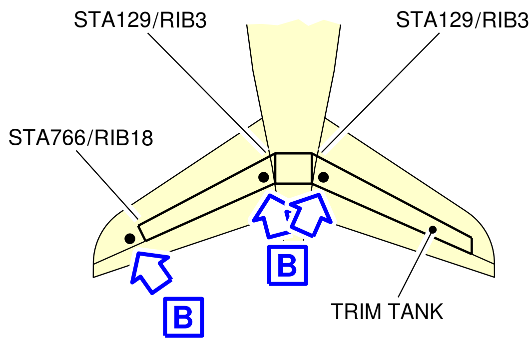
(g) Continuously monitor the fuel flow into the container. Make sure that there is sufficient space in the container for all of the drained fuel. Replace the container as necessary.

(h) Continue the suction draining procedure until no fuel flows.

(i) When no fuel flows, remove the 98A28104000000 PURGING TOOL - WATER DRAIN and the container(s).

**ON A/C A330-200 A330-300





NOTE:
01 DEPENDING ON A/C CONFIGURATION

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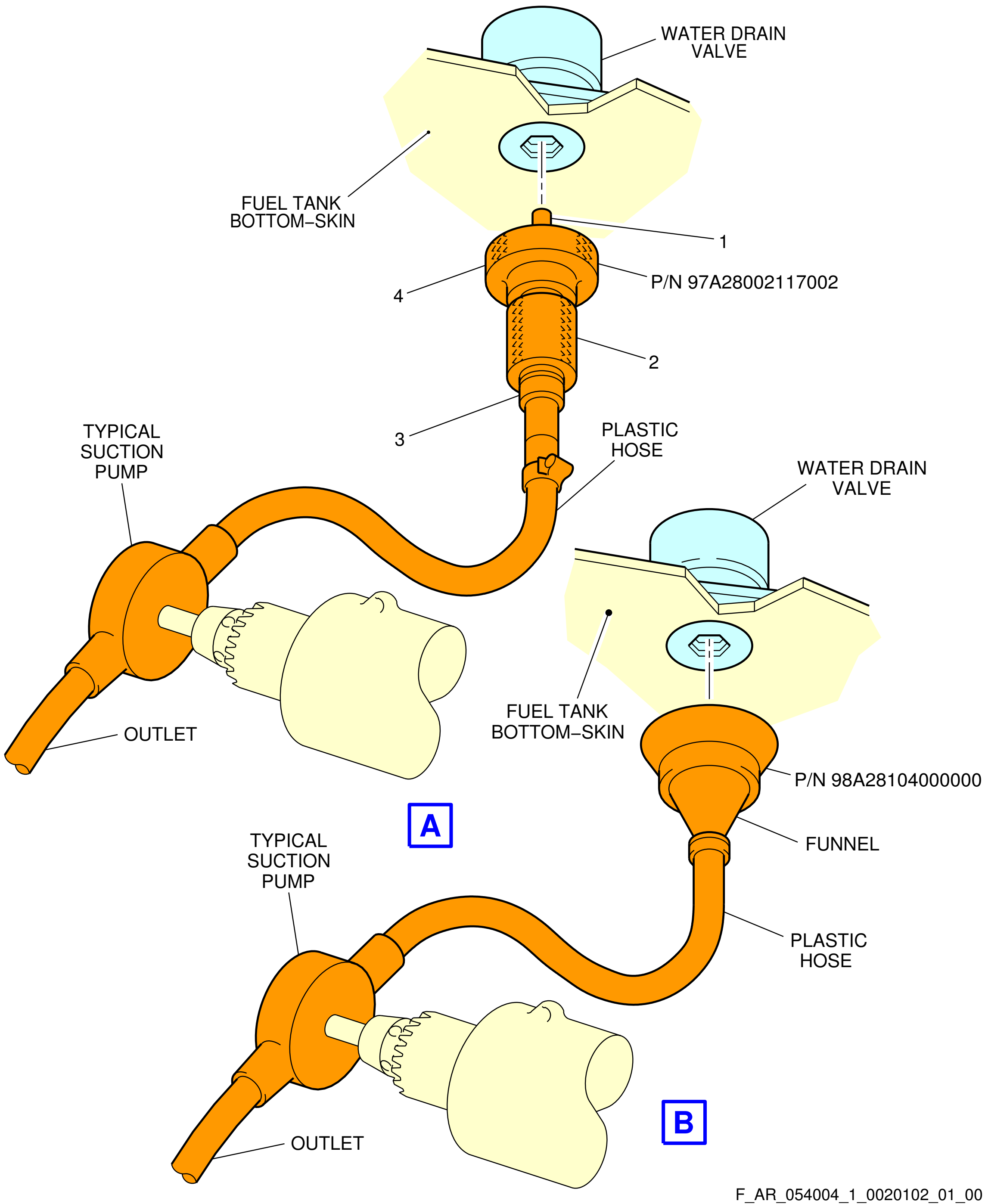
Drain Remaining Fuel
Water Drain Valves - Locations (Sheet 1 of 2)
FIGURE-05-40-04-991-002-A01

**ON A/C A330-200 A330-300



Drain Remaining Fuel
Purging Tool Installation (Sheet 2 of 2)
FIGURE-05-40-04-991-002-A01

05-50 CARGO COMPARTMENTS

05-50-00 CARGO COMPARTMENTS

****ON A/C A330-200 A330-300**

DESC 05-50-00-005-A01

General

1. General
   This chapter gives data related to the removal of the cargo from the aircraft. The removal of the cargo is an important task carried out during an aircraft recovery operation. Cargo removal will remove a large amount of weight from the aircraft and can also control the Center of Gravity (CG).
   The procedure you select to remove the cargo during the aircraft recovery operation should only be made after a survey has been carried out to find:
   - The aircraft stability and attitude.
   - The extent of damage to the aircraft structure and components.
   - The condition of the aircraft electrical systems.
   - The condition of the cargo loading system.
   - If an external ground power source is available.
   - If the equipment necessary to remove the cargo is available.

   The removal of the cargo is important but not all recovery operations will require its removal. When a small amount of cargo is loaded it is possible that it is not necessary to remove it. This decision can only be made once the survey has been completed. Decisions can also be made to remove the cargo only to the point where the maximum lifting and jacking loads will not be exceeded or the aircraft recovery operation can be completed.

05-60 REMOVAL OF LARGE COMPONENTS

05-60-00 REMOVAL OF LARGE COMPONENTS

****ON A/C A330-200 A330-300**

DESC 05-60-00-001-A01

General

1. Large aircraft components are not usually removed during a recovery operation.

   WARNING : YOU MUST CONTACT AIRBUS BEFORE YOU MANUALLY OPERATE A SYSTEM OR REMOVE A COMPONENT WHEN THE AIRCRAFT IS IN AN ABNORMAL ATTITUDE OR DISABLED. THE AMM PROCEDURES ARE APPLICABLE ON AN AIRCRAFT IN A LEVEL CONFIGURATION ONLY.

   Removal can be necessary when:
   - Damaged components such as flap sections, ailerons, elevators, etc. are not safely attached,
   - It is necessary to decrease the weight and/or to control CG,
   - The runway or the airport was closed because of the accident. In this case, it is necessary to remove the vertical stabilizer. This is an unusual event which can occur only if the runway or airport would be closed for a long time,
   - You used escape slides during evacuation. After the evacuation, it is necessary to carefully disconnect and remove the escape slides,
   - Landing gear and/or other components are broken.

LEVELING AND LIFTING

06-00 LEVELING AND LIFTING

06-00-00 LEVELING AND LIFTING

****ON A/C A330-200 A330-300**

DESC 06-00-00-001-A01

General

1. Leveling and Lifting Families
   There are 5 basic leveling families (see 06-60-00).
2. Aircraft Pitch and Roll Angles
   Before you start the recovery, it is possible to find the aircraft pitch and roll angles when no electrical power is available.
   The items of equipment that you can use are:
   - An attitude monitor, located in the belly fairing.
   - A spirit level, a clinometer or similar device located on the forward cargo-compartment floor beams or on the cabin floor seat tracks.

   It is possible to use the same equipment to find when the aircraft is leveled.
3. Leveling/Lifting of the Aircraft
   There are three general methods to level/lift the aircraft. They are given in the chapters that follow:
   - Use of Jacks (see 06-30-00),
   - Use of Pneumatic Lifting Bags (see 06-40-00),
   - Use of Cranes (see 06-50-00),
   - Step by step combination: use of one method and then another one.

   A. The leveling/lifting items of equipment are:
      - Jacks,
      - Pneumatic lifting bags,
      - Cranes and slings.

      It is possible to use one of these items of equipment alone or more than one in any step-by-step combination.

   B. The procedures in the chapters above describe how to level/lift the aircraft to a height at which the fuselage datum is 6500 mm (255.9 in) above the ground. This is the height necessary:
      - To put the aircraft in a hangar or on maintenance jacks,
      - To make the extension of the landing gear possible,
      - To put the aircraft, or part of it, on a mobile device.

      However, to replace a landing gear, the necessary height of the fuselage datum is 7200 mm (283.46 in) above the ground.

C. The aircraft can be in such an attitude that it is necessary to do the leveling operation before the lifting operation.
In this case, you must keep the aircraft in a level attitude during the lifting phase.

NOTE : As each aircraft recovery situation is different, you must analyze the conditions and available equipment before you decide which leveling or lifting procedure you will use.

****ON A/C A330-200 A330-300**

DESC 06-00-00-002-A01

Leveling/Lifting Obstructions

1. It may be necessary to remove the items that follow to make the leveling /lifting operation easier.

NOTE : The list is not exhaustive. The optional items of equipment can change as they are related to the customer configuration.

Name	Zone	IPC	AMM
Drain Mast	Z130	See IPC 30-71-02	See AMM 30-71-51-000-801
DME 1 & 2	Z130	See IPC 34-51-02	See AMM 34-51-11-000-801
VHF Antenna	Z230	See IPC 23-12-02	See AMM 23-12-11-000-801
Marker Antenna	Z130	See IPC 34-55-02	See AMM 34-55-18-000-802
ATC 1 & 2	Z130-Z230	See IPC 34-52-02	See AMM 34-52-11-000-801
Outflow Valve	Z130	See IPC 21-31-02	See AMM 21-31-51-000-801

FWD Fuselage

TABLE 1

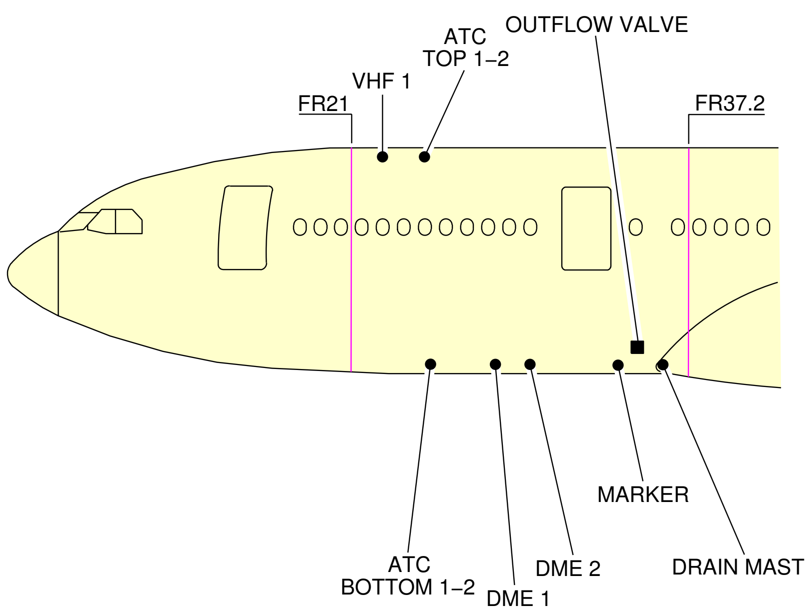
Name	Zone	IPC	AMM
Drain Mast	Z150	See IPC 30-71-04	See AMM 30-71-51-000-801
Radio Altimeter	Z150	See IPC 34-42-04	See AMM 34-42-11-000-801
VHF Antenna	Z150-Z260	See IPC 23-12-04	See AMM 23-12-11-000-801
Outflow Valve	Z150	See IPC 21-31-04	See AMM 21-31-51-000-801

Aft Fuselage

TABLE 2

**ON A/C A330-200

DEPENDING ON A/C CONFIGURATION



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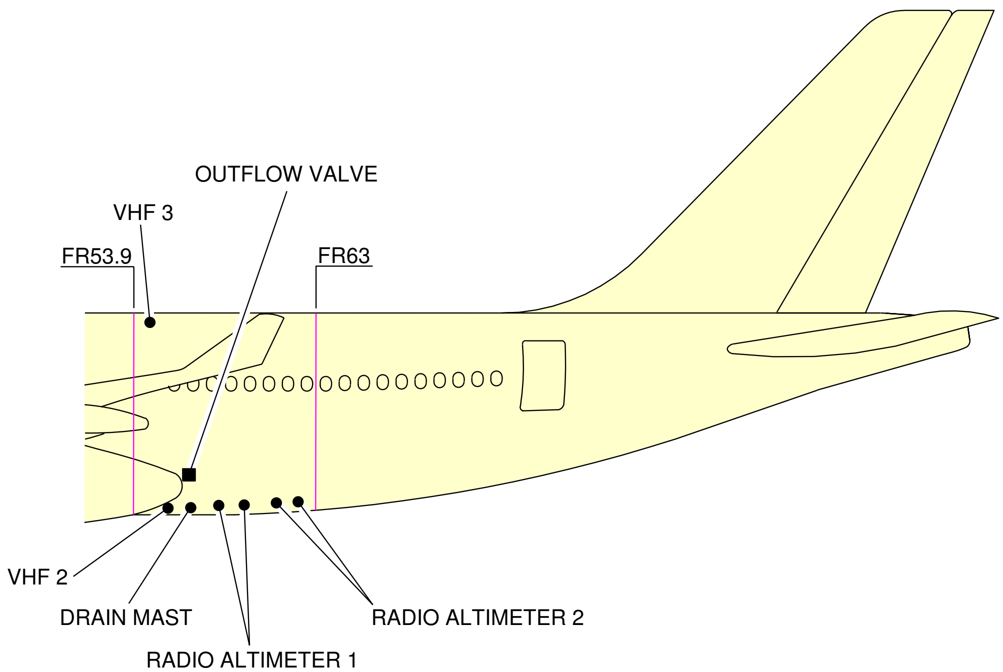
Antennas Location
FWD Fuselage (Sheet 1 of 2)
FIGURE-06-00-00-991-001-A01

**ON A/C A330-200



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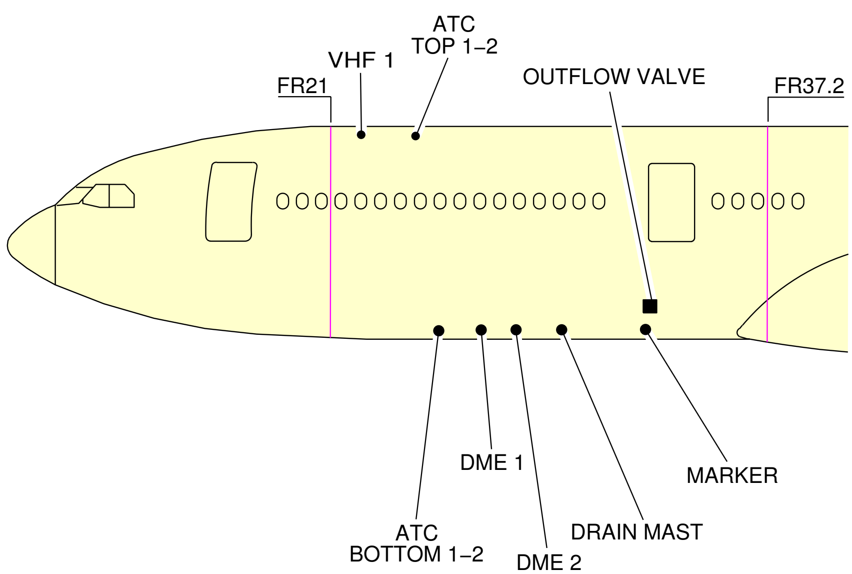
Antennas Location
Aft Fuselage (Sheet 2 of 2)
FIGURE-06-00-00-991-001-A01

**ON A/C A330-300



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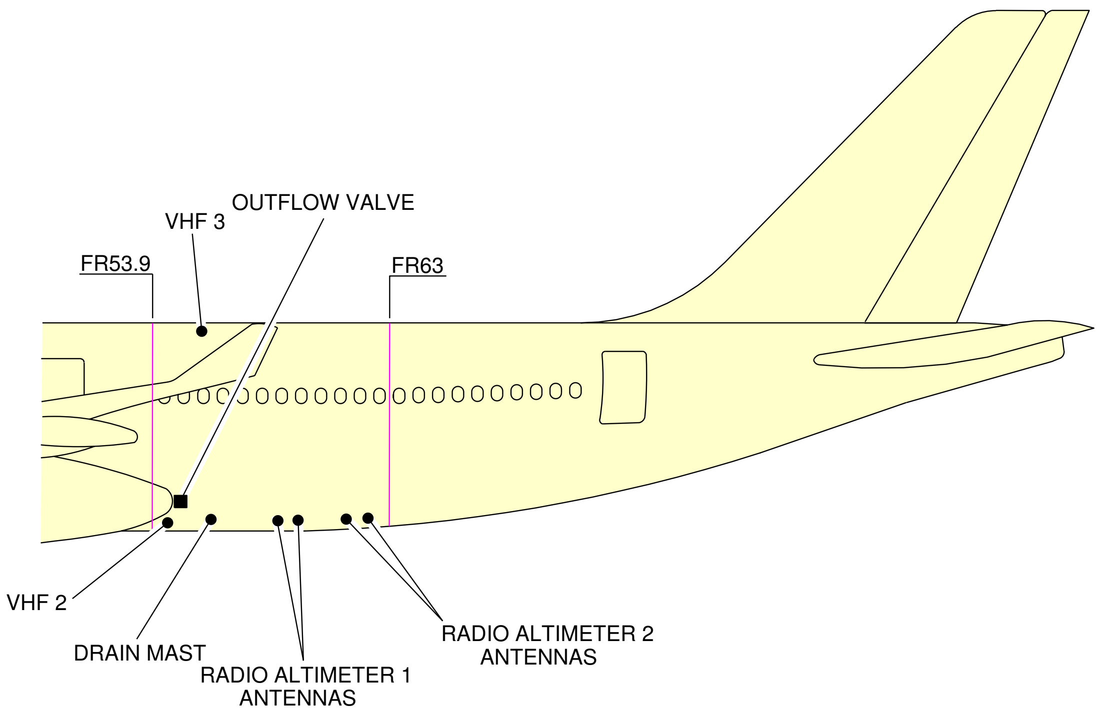
Antennas Location
FWD Fuselage (Sheet 1 of 2)
FIGURE-06-00-00-991-001-C01

**ON A/C A330-300



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Antennas Location
Aft Fuselage (Sheet 2 of 2)
FIGURE-06-00-00-991-001-C01

06-10 LOAD DETERMINATION

06-10-00 LOAD DETERMINATION

****ON A/C A330-200 A330-300**

TASK 06-10-00-970-801-A01

Vertical Loads Determination

1. General
This section gives data about the vertical loads related to aircraft leveling/lifting during the recovery operation and about the way to calculate them.

NOTE : The information or principle contained in this chapter are given as a guide to assist an aircraft recovery.

2. Inspections
Not Applicable.

3. Job Setup References

A. General
The theoretical calculations that follow help to find the loads necessary for leveling/lifting. They also help to:
- Make sure the aircraft is stable,
- Do a selection of applicable methods of leveling/lifting,
- Do a check of the local structural capability of the aircraft to prevent secondary damage,
- Make sure the recovery procedure is applicable to the related weight condition of the aircraft.

The simplified calculations are related to the assumptions that follow:
- The aircraft structure is considered as rigid. The calculations do not take into account the flexibility in the aircraft structure,
- The leveling/lifting is done at 3 points (isostatic conditions),
- The calculation take into account only the vertical loads,
- You do the leveling/lifting operations on solid ground conditions and the slings are without elongation,
- The calculation do not take into account the effects of wind and temperature.

B. Location of the 3 lifting points on the aircraft X and Y reference axes
See FIGURE 06-10-00-991-001-A.
- For jacks: X and Y position of the jacking points,
- For pneumatic lifting bags: X and Y positions of the center of the contact area,
- For slings: X position of the crane/sling lifting plane.

NOTE : During the leveling/lifting procedure, it can be necessary to use only one lifting point. The aircraft will then pivot around a fixed point such as a main landing gear. For example, with the nose landing gear collapsed, there is only one lifting point and the aircraft will pivot around main landing gears.

4. Job Set-up Information

A. Referenced Information

REFERENCE	DESIGNATION
06-60-00	06-60-00-LEVELING AND LIFTING SCENARIOS
03-00-00	03-00-00-WEIGHT AND CG MANAGEMENT
FIGURE 06-10-00-991-001-A	FIGURE 06-10-00-991-001-A-Load Determination
FIGURE 06-10-00-991-002-A	FIGURE 06-10-00-991-002-A-Load Determination

Referenced Information

TABLE 1

5. Procedure

Subtask 06-10-00-970-001-A01

A. Load Calculation

NOTE : Principle for the calculation of the loads at the recovery leveling/lifting points.

(1) Find the 3 leveling/lifting points and related X and Y values, applicable to the attitude of the aircraft and the related scenario (see 06-60-00).

(2) Find the values of the NRW, XG and YG (X and Y coordinates of aircraft CG position) calculated for your aircraft condition (see 03-00-00).

(3) Record these values in the load calculation worksheet (see FIGURE 06-10-00-991-002-A) and calculate the necessary intermediate values.

(4) Use the results of the load calculation worksheet (see FIGURE 06-10-00-991-002-A) to find the values of the vertical loads (Fz) at the 3 leveling/lifting points.
$Fz1 = NRW \times ((YG - Y2)(X2 - X3) - (XG - X2)(Y2 - Y3)) / ((X1 - X2)(Y2 - Y3) - (Y1 - Y2)(X2 - X3))$
$Fz1 =$
$Fz2 = NRW \times ((YG - Y3)(X3 - X1) - (XG - X3)(Y3 - Y1)) / ((X2 - X3)(Y3 - Y1) - (Y2 - Y3)(X3 - X1))$
$Fz2 =$
$Fz3 = NRW \times ((YG - Y1)(X1 - X2) - (XG - X1)(Y1 - Y2)) / ((X3 - X1)(Y1 - Y2) - (Y3 - Y1)(X1 - X2))$
$Fz3 =$

Subtask 06-10-00-869-001-A01

B. Load Distribution Compared to Allowable Loads

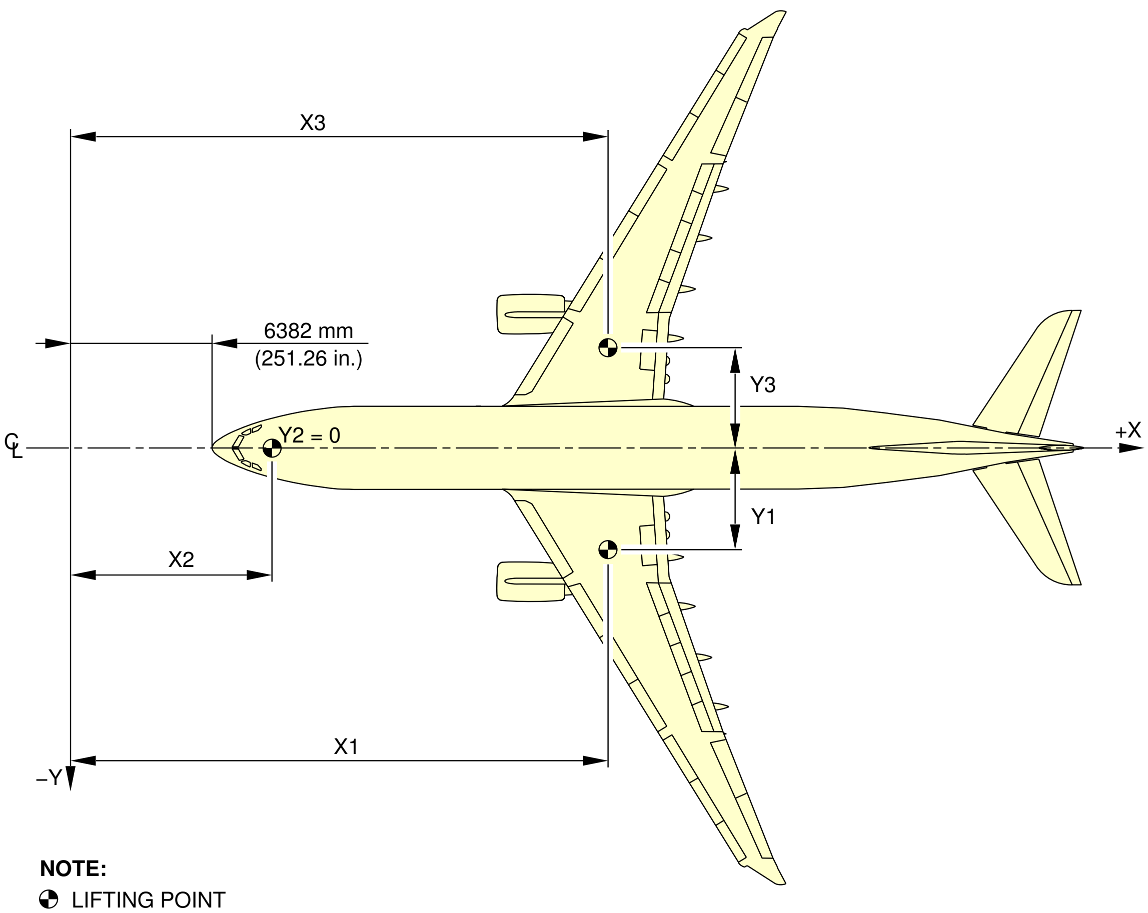
(1) For jacks: You must compare the vertical load directly with the allowable load.

(2) For pneumatic lifting bags:
Use the formula that follows to calculate the pressure of the pneumatic lifting bag:
$p = Fz / (L \times W)$
L = length and W = width of the pneumatic lifting bag.
This pressure must be less than or equal to:
- The maximum pressure of the pneumatic lifting bag,
- The maximum allowable pressure that the pneumatic lifting bag can apply to the aircraft structure.

(3) For slings:
Use the formula that follows to calculate the load on each sling:
$f = Fz / N$
N = number of slings.
This load must be less than or equal to the aircraft maximum allowable load at the related frame.

NOTE : If loads at leveling/lifting points are not in the allowable values, it is necessary to make new calculations for the recovery configuration, with:
- A modified weight and balance,
- A change in the recovery means arrangements,
- The use of other applicable recovery methods,
- Or any combinations of these modifications.

**ON A/C A330-200 A330-300



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Load Determination
Location of the 3 Lifting Points
FIGURE-06-10-00-991-001-A01

**ON A/C A330-200 A330-300

SEE 03–00–00	NET RECOVERABLE WEIGHT	XG	YG
LEVELING/LIFTING POINT 1 SEE 06–00–00		X1	Y1
LEVELING/LIFTING POINT 2 SEE 06–00–00		X2	Y2
LEVELING/LIFTING POINT 3 SEE 06–00–00		X3	Y3
INTERMEDIATE CALCULATIONS	X1–X2	X2–X3	X3–X1
	XG–X1	XG–X2	XG–X3
	Y1–Y2	Y2–Y3	Y3–Y1
	YG–Y1	YG–Y2	YG–Y3

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Load Determination
Load Calculation Worksheet
FIGURE-06-10-00-991-002-A01

****ON A/C A330-200 A330-300**

TASK 06-10-00-970-802-A01

Side loads on Jack Fittings

1. General
This section gives data about the side loads on jack fittings related to the aircraft leveling/lifting phase during the recovery operation and about the way to calculate them.
When you level the aircraft from an unusual attitude, an arc movement (horizontal translation) of the jacking point is related to the displacement.
If you use a special recovery jack, the jack head can move along the arc movement. Thus, there are no related side loads applied on the jacking point.
If you use a jack that cannot move along the arc movement, the jack will apply side loads to the aircraft structure. If these side loads are more than the allowable loads, they will cause damage to the aircraft structure. It is necessary to calculate the side loads for each leveling/lifting scenario.

NOTE : The information or principle contained in this chapter are given as a guide to assist an aircraft recovery.

2. Inspections
Not Applicable.

3. Job Setup References
Not Applicable.

4. Job Set-up Information

A. Referenced Information

REFERENCE	DESIGNATION
TASK 06-10-00-970-801-A01	TASK 06-10-00-970-801-A01-Vertical Loads Determination
06-60-00	06-60-00-LEVELING AND LIFTING SCENARIOS
03-00-00	03-00-00-WEIGHT AND CG MANAGEMENT

Referenced Information

TABLE 1

5. Procedure

CAUTION : BE CAREFUL WHEN YOU USE A JACK THAT CANNOT MOVE ALONG THE ARC MOVEMENT. THE JACK WILL APPLY SIDE LOADS TO THE AIRCRAFT STRUCTURE. IF THESE LOADS ARE MORE THAN THE ALLOWABLE LOADS, THEY WILL CAUSE DAMAGE TO THE STRUCTURE.

Subtask 06-10-00-970-002-A01

A. Load Calculation

(1) Find the aircraft recovery configuration and a leveling/lifting method.

(2) Measure the aircraft pitch (β) and lateral (α) angles with one of the tools or the method that follow:
- An attitude monitor (clinometer), in the right wing landing gear bay,
- A spirit level, a clinometer or equivalent device that can be used on the forward cargo-compartment floor beams or on the cabin floor seat tracks,
- The aircraft geometry and characteristic points.

See 06-60-00 to find the applicable recovery scenario and the related typical aircraft possible angles.

NOTE : The typical angles are given as an example. For all scenarios, you must measure the aircraft pitch and lateral angles for each recovery operation before you start any leveling/lifting procedure. The actual angles are related to the weight and CG configuration of the recovery aircraft.

(3) Calculate the NRW and CG position (see 03-00-00) and calculate the vertical loads (Fz) (see TASK 06-10-00-970-801-A01) at the leveling/lifting point.

(4) Calculate the Fx side load (component on the X axis).
$Fx = \tan \beta \times Fz$

(5) Calculate the Fy side load (component on the Y axis).
$Fy = \tan \alpha \times Fz$

(6) Calculate the resultant (R) of Fx and Fy:
$R = \sqrt{(Fx^2 + Fy^2)}$

(7) Make sure the resultant R is less than the maximum allowable side load. If the side load is not less than or equal to the maximum allowable load, you must reduce the applied vertical load until the resultant side load is less than the allowable side load. To reduce the applied vertical load, you can reduce the weight of the aircraft.

****ON A/C A330-200 A330-300**

TASK 06-10-00-970-803-A01

Arc Movement Calculation

1. General
This section gives data about the arc movement of the leveling/lifting point related to the aircraft leveling/lifting during the recovery operation and about the way to calculate it.

NOTE : The information or principle contained in this chapter are given as a guide to assist an aircraft recovery.

2. Inspections
Not Applicable.

3. Job Setup References
When you level the aircraft, it will rotate around a fixed pivot point on the ground and this will cause movement along the X or Y axis. This movement is called Arc Movement.
You must control this movement during all the recovery procedure.

4. Job Set-up Information

A. Referenced Information

REFERENCE	DESIGNATION
FIGURE 06-10-00-991-003-A	FIGURE 06-10-00-991-003-A-Arc Movement Calculation
FIGURE 06-10-00-991-004-A	FIGURE 06-10-00-991-004-A-Arc Movement Calculation

Referenced Information

TABLE 1

5. Procedure

Subtask 06-10-00-970-003-A01

A. Arc Movement Calculation at Fuselage Leveling/Lifting Points

(1) Measurement at Aircraft Basic Position
See FIGURE 06-10-00-991-003-A.
You must make the measurements at the points that follow:
- Fixed pivot point: the point around which the aircraft will rotate (X axis).
- Fuselage/ground contact point: the contact point between the fuselage and the ground. This point must be lifted to a level attitude (X axis).
- Leveling/Lifting point: the point where you apply the loads and where you calculate the arc movement (X axis).
- Characteristic point: a point on the lower part of fuselage that you will use for angle calculation (both X and Z axes).

(2) Arc Movement Calculation

(a) Calculate the angle:
$\tan \beta = dz / dx$
Where:
dx is the distance from the fuselage ground contact point to the characteristic point on the lower part of the fuselage.
dz is the height from the ground to the characteristic point.

(b) Calculate the arc movement.
$\Delta X = (L - L') - \sqrt{((L - L')^2 + \tan^2 \beta \times (L'^2 - L^2))}$
Where:
ΔX is the arc movement.
L is the distance from the fuselage ground contact point to the fixed pivot point (for example: main landing gear).
L' is the distance from the fuselage ground contact point to the leveling/lifting point.

Subtask 06-10-00-970-004-A01

B. Arc Movement Calculation at Wing Leveling/Lifting Points

(1) Measurement at Aircraft Basic Position
See FIGURE 06-10-00-991-004-A.
You must make the measurements at the points that follow:
- Fixed pivot point: the point around which the aircraft will rotate (Y axis).
- Wing/ground contact point on the lower wing: the contact point between the wing and the ground. This point must be lifted to a level attitude (Y axis).
- Leveling/Lifting point: the point were you apply the loads and where you calculate the arc movement (Y axis).
- Characteristic point: a point on the lower part of the inboard engine nacelle on the high wing that you use for angle calculation (the two Y and Z axes).

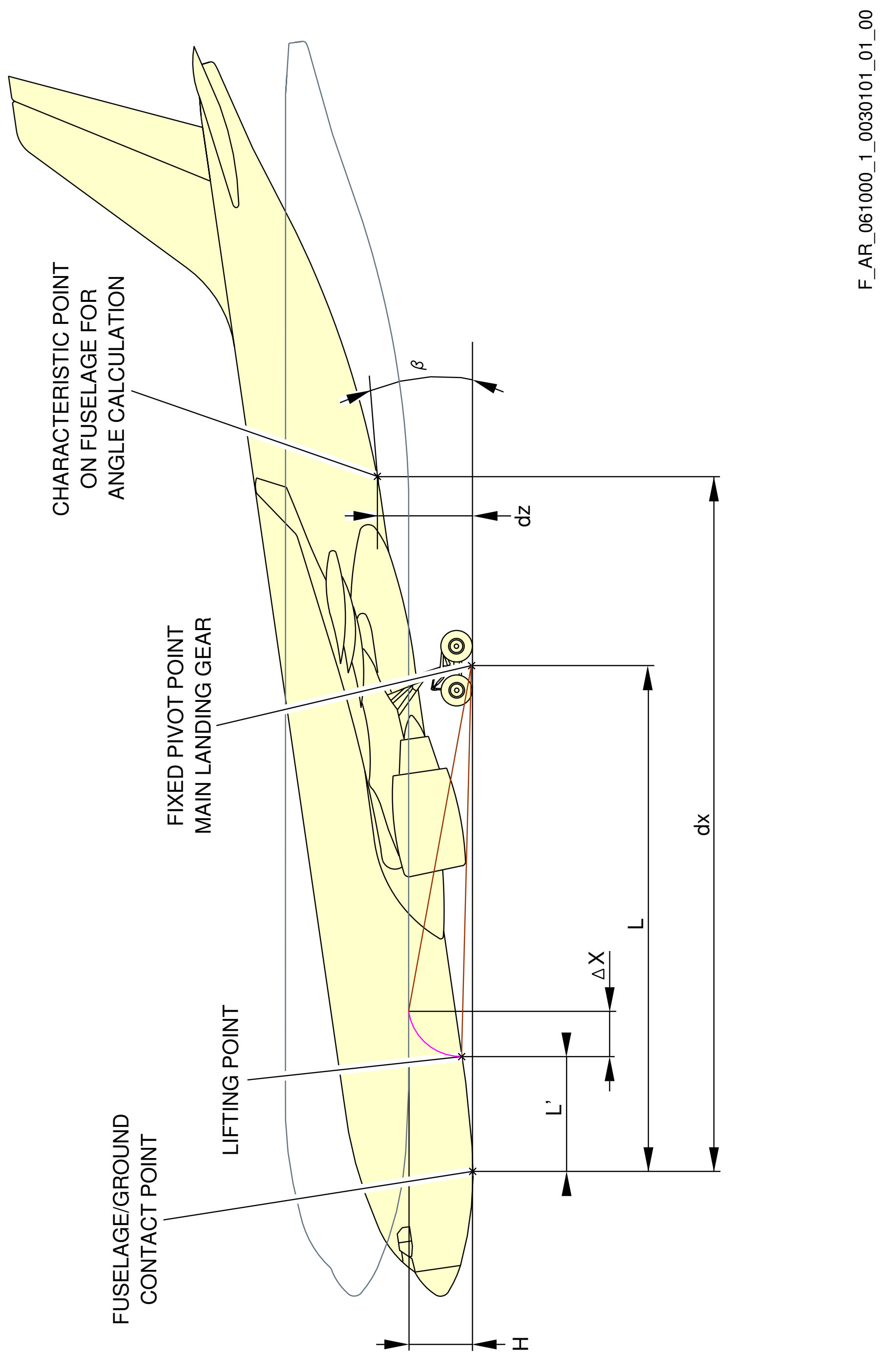
(2) Arc Movement Calculation

(a) Calculate the angle.
$\tan \alpha = dz / dy$
Where:
dy is the distance from the wing ground contact point (lower wing) to the characteristic point on the lower part of the inboard engine nacelle on the higher wing.
dz is the height from the ground to the characteristic point.

(b) Calculate the arc movement.
$\Delta Y = (L - L') - \sqrt{((L - L')^2 + \tan^2 \alpha \times (L'^2 - L^2))}$
Where:
ΔY is the arc movement.
L is the distance from the wing ground contact point to the fixed pivot point (for example: main landing gear).

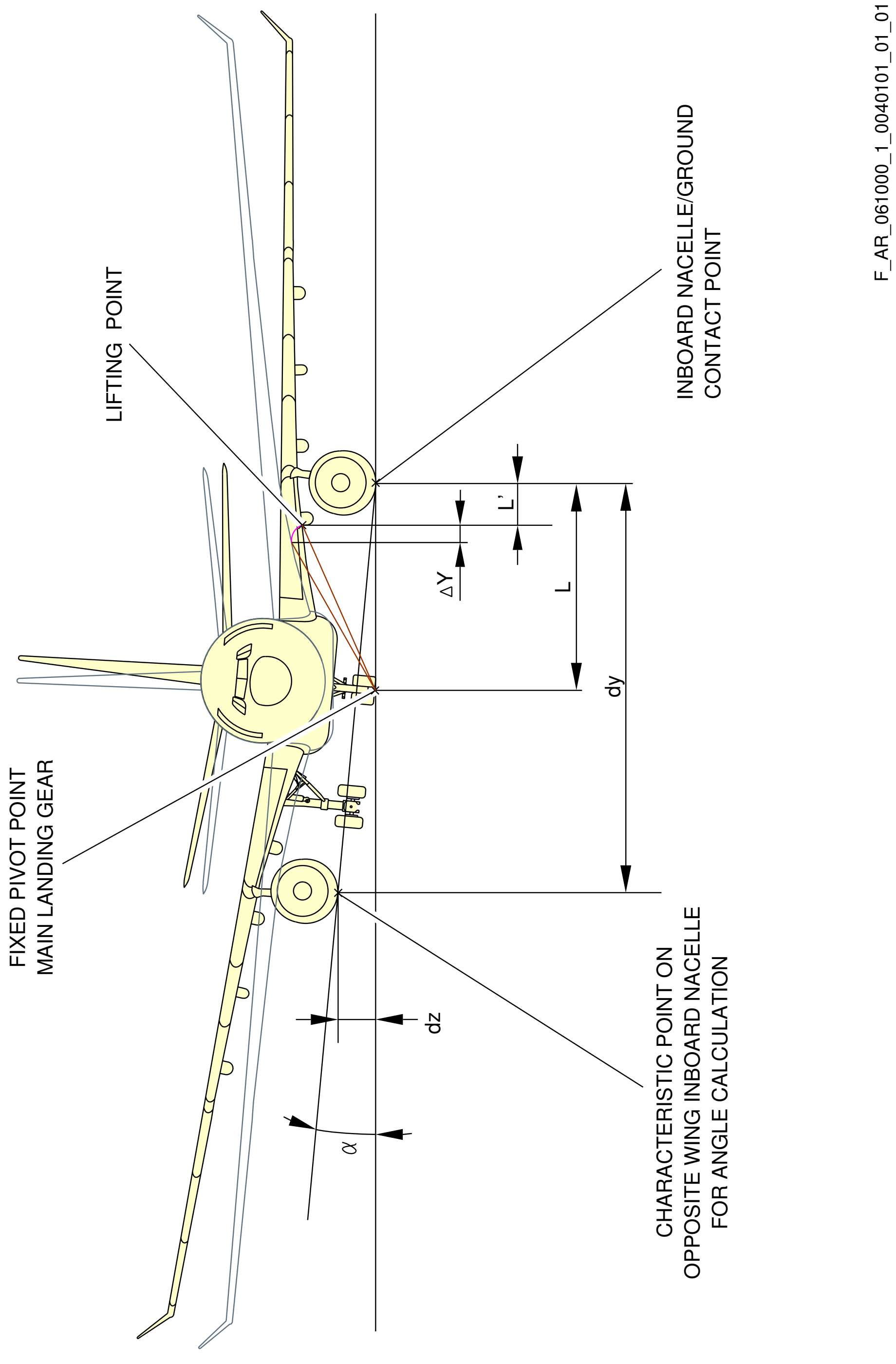
L' is the distance from the wing ground contact point to the leveling/lifting point.

**ON A/C A330-200 A330-300



Arc Movement Calculation
Fuselage Leveling/Lifting Point
FIGURE-06-10-00-991-003-A01

**ON A/C A330-200 A330-300



Arc Movement Calculation
Wing Leveling/Lifting Point
FIGURE-06-10-00-991-004-A01

06-30 USE OF JACKS

06-30-00 USE OF JACKS

****ON A/C A330-200 A330-300**

DESC 06-30-00-001-A01

General

1. General Type of Jacks

CAUTION : YOU CAN USE ALL COMBINATIONS OF THE JACKING POINTS (ONE OR MORE) TO LEVEL/LIFT THE AIRCRAFT. THE JACK LOADS AT EACH JACKING POINT MUST NOT BE MORE THAN THE ALLOWABLE LOADS (VERTICAL (FZ) AND HORIZONTAL (FH).

CAUTION : WHEN YOU LEVEL/LIFT THE AIRCRAFT, YOU MUST CONTINUOUSLY MONITOR AND RECORD THE LOADS AND MAKE SURE THAT THE LOADS YOU APPLY ARE NOT MORE THAN THE MAXIMUM ALLOWABLE LOADS. IF THE LOADS ARE MORE THAN THE ALLOWABLE LOADS, THIS CAN CAUSE DAMAGE TO THE AIRCRAFT STRUCTURE.

NOTE : The information or principle contained in this chapter are given as a guide to assist an aircraft recovery.

There are three general types of jacks:

A. Special Aircraft Recovery Jacks

This type of jack can move along the arc movement in the specified limits.
The jack manufacturer instructions must be obeyed.
There are two primary types of aircraft recovery jacks: hydraulic and low profile multi-stage jacks:

- Monopole design:
  This is a multi stage single ram attached to a large base plate. The jacking head can move along the arc movement in the specified limits.
- Tripod design:
  This type of jack is almost the same as a hanger or maintenance tripod jack. The difference is that it is possible to operate and control each multi-stage leg independently. Pressure gauges are installed on each leg to monitor loads independently. The operator can make sure the jack head moves in a limited arc. It is possible to operate the jack manually with a lever or control it from a powered console.

B. Standard Maintenance Tripod Jacks

This type of jack can only do a very limited arc movement. We recommend you do not use a standard maintenance jack for recovery operations. When you use a standard maintenance jack, it is necessary to do the lifting operation in small steps and reposition the jack between each step.

C. Bottle or Wheel Jacks
They can be used for initial leveling or lifting in constricted areas. They have the same limit as the standard maintenance tripod jacks.

2. Location of Primary Jacking Points
There are three primary jacking points on the aircraft (See FIGURE 06-30-00-991-006-AFIGURE 06-30-00-991-006-B):
- One under the left wing, at RIB 10,
- One under the right wing, at RIB 10,
- One on the lower fuselage, behind the nose landing gear doors, at FR10A.

****ON A/C A330-200**

3. Location of Auxiliary Jacking Points
An auxiliary jacking point for a safety stay is located on the lower aft fuselage, at FR87 (See FIGURE 06-30-00-991-006-A).
A jack must be installed in this position only once the aircraft is level. This point must be used to make the aircraft stable only.

****ON A/C A330-300**

4. Location of Auxiliary Jacking Points
An auxiliary jacking point for a safety stay is located on the lower aft fuselage, at FR85 or FR87 depending on A/C Model (See FIGURE 06-30-00-991-006-B).
A jack must be installed in this position only once the aircraft is level. This point must be used to make the aircraft stable only.

****ON A/C A330-200 A330-300**

5. Location of FR17 Jacking Point
Jacks can also be used to level/lift the forward fuselage with fittings attached to FR17.
See FIGURE 06-30-00-991-007-A and 04-30-00 for jacking pad fitting FR17 location.

6. Maximum Loads on the Primary Jacking Point
See 06-10-00 to determine the loads related to the aircraft attitude, to select the leveling/lifting procedure.
Fz is the load applied in the vertical direction.
Fh is the load applied in all horizontal directions.

<u>NOTE</u> : The maximum aircraft jacking weight is 152 000 kg (335 103 lb).
Airbus recommends that you use load cells and lifting devices with side load measuring equipment that can accurately record and report the jacking point side loads.
Longitudinal or lateral load must not be more than 0.33 safe load at the jacking point.

Jacking Point	Fz (daN)	Fz (lbf)	Fh (daN)	Fh (lbf)
RH Wing	81 084	182 284	26 758	60 154
LH Wing	81 084	182 284	26 758	60 154

Jacking Point	Fz (daN)	Fz (lbf)	Fh (daN)	Fh (lbf)
Nose	12 300	27 651	4 059	3 338

Allowable Loads on Primary Jacking Points

TABLE 1

****ON A/C A330-200**

7. Maximum Loads on the Safety Stay at FR87

CAUTION : YOU MUST NOT USE THE SAFETY STAY TO LEVEL OR LIFT THE AIRCRAFT.
See 06-10-00 to calculate the loads related to the aircraft attitude and to find the applicable leveling/lifting procedure.

Jacking Point	Fz (daN)	Fz (lbf)	Fh (daN)	Fh (lbf)
Safety Stay	4 500	10 116	1 485	3 338

Allowable Loads on the Safety Stay

TABLE 2

****ON A/C A330-300**

8. Maximum Loads on the Safety Stay at FR85 or FR87 depending on A/C Model

CAUTION : YOU MUST NOT USE THE SAFETY STAY TO LEVEL OR LIFT THE AIRCRAFT.
See 06-10-00 to calculate the loads related to the aircraft attitude and to find the applicable leveling/lifting procedure.

Jacking Point	Fz (daN)	Fz (lbf)	Fh (daN)	Fh (lbf)
Safety Stay	4 500	10 116	1 485	3 338

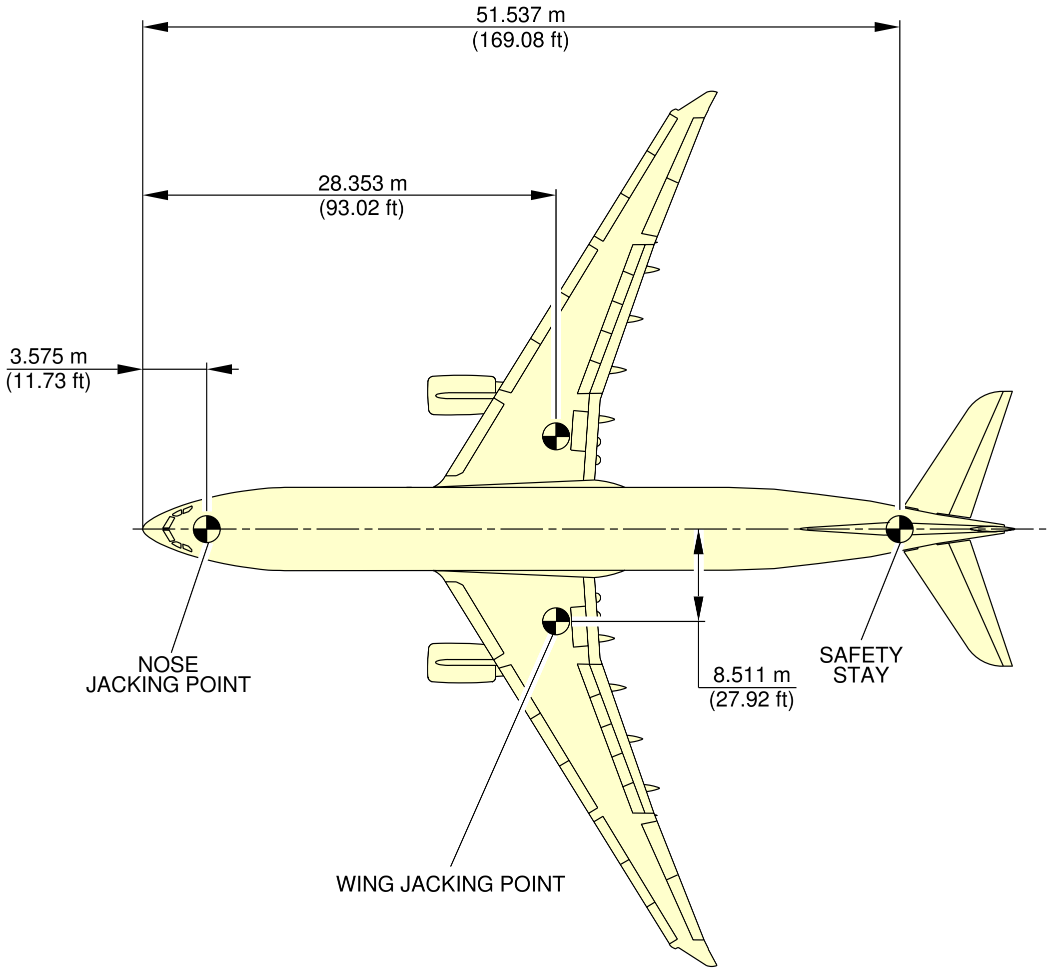
Allowable Loads on the Safety Stay

TABLE 3

****ON A/C A330-200 A330-300**

9. Maximum Loads on the Jacking Pad Fittings at FR17
See 06-10-00 to calculate the loads related to the aircraft attitude to select the applicable leveling/lifting procedure.
See FIGURE 06-30-00-991-007-A to determine the maximum aircraft weight and associated CG.

**ON A/C A330-200



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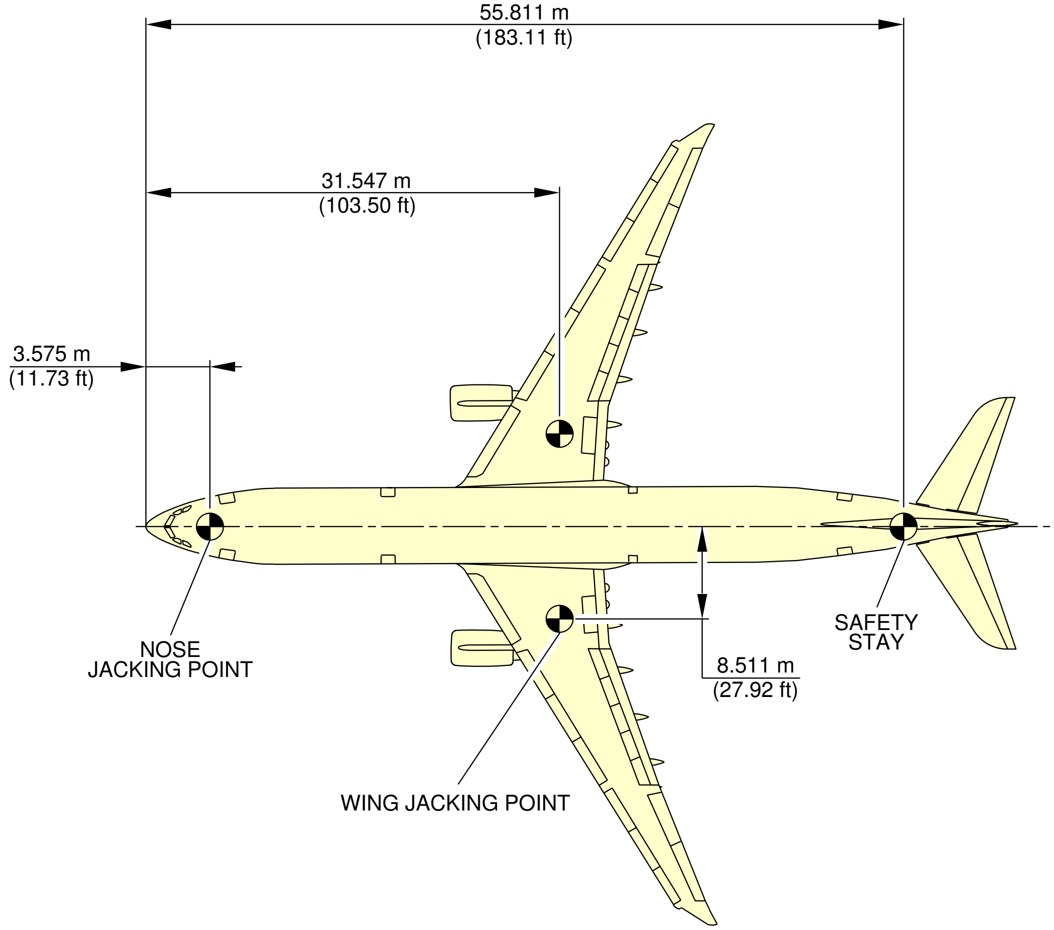
Jacking Points
Location
FIGURE-06-30-00-991-006-A01

**ON A/C A330-300



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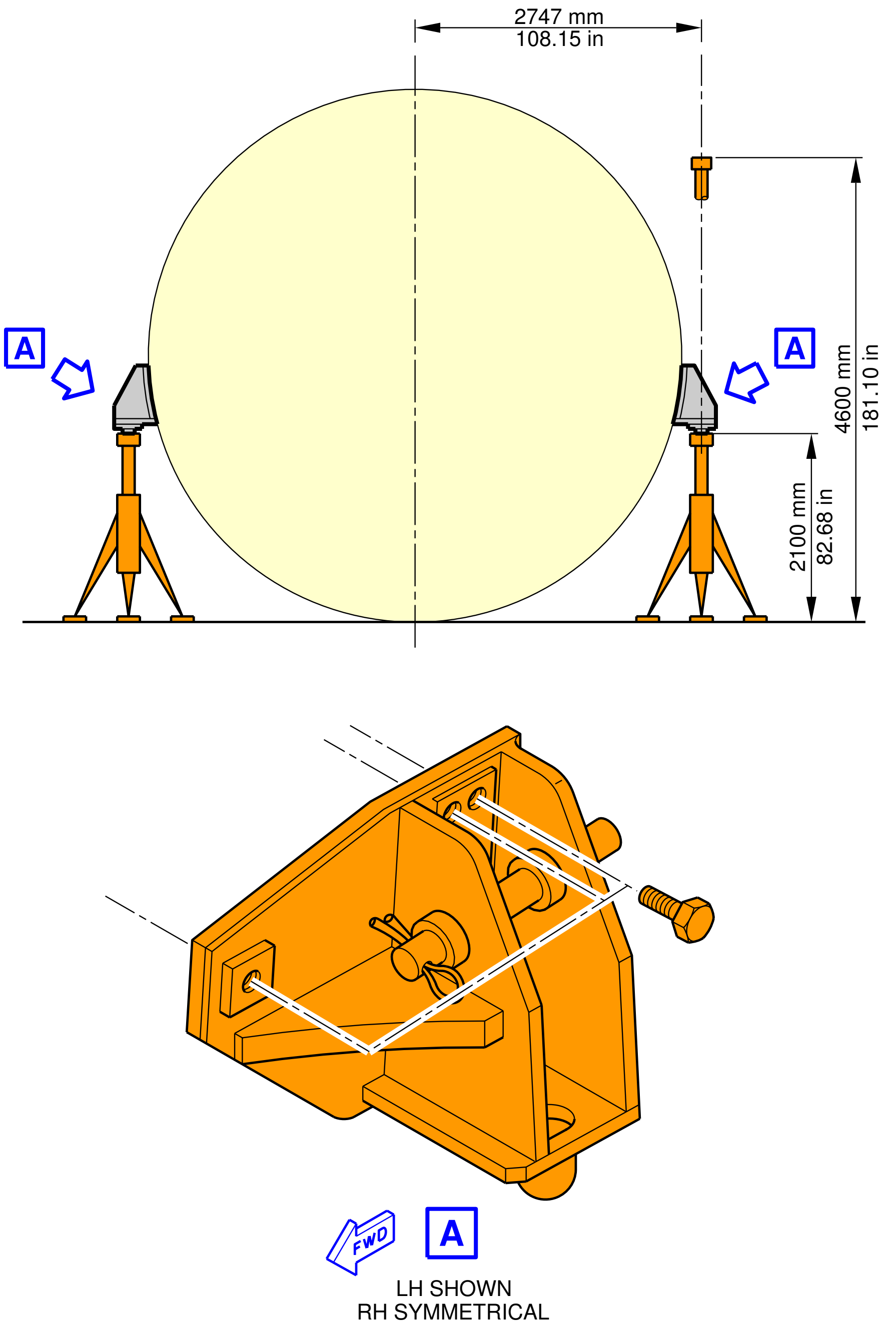
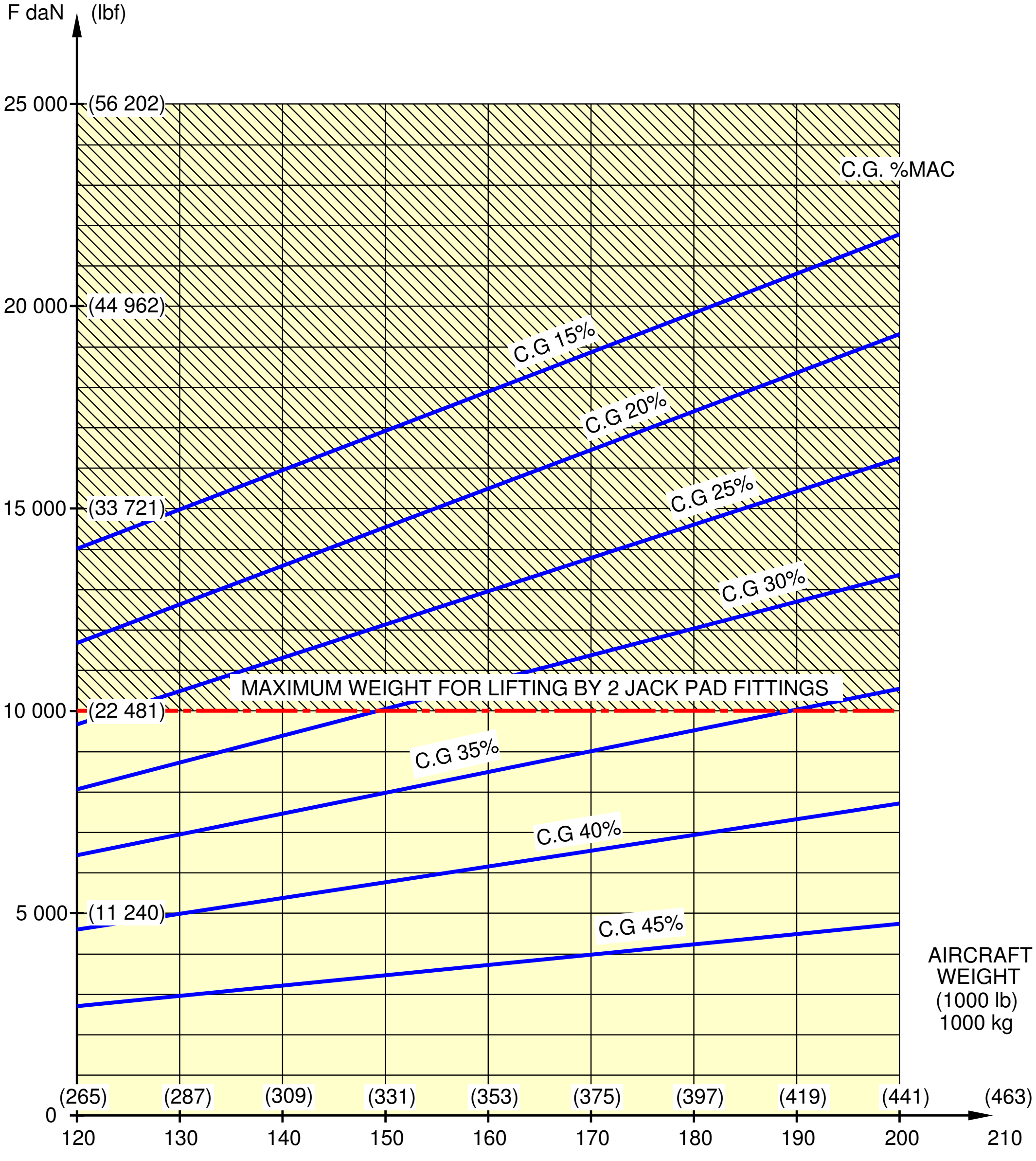
Jacking Points
Location
FIGURE-06-30-00-991-006-B01

**ON A/C A330-200 A330-300



Jack Pad Fittings at FR17
Location (Sheet 1 of 2)
FIGURE-06-30-00-991-007-A01

**ON A/C A330-200 A330-300



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Jack Pad Fittings at FR17
Maximum Allowable Loads (Sheet 2 of 2)
FIGURE-06-30-00-991-007-A01

****ON A/C A330-200 A330-300**

TASK 06-30-00-581-802-A01

Jacking

1. General
This section gives the data related to the aircraft jacking for leveling or lifting.

NOTE : If you use jacks to level or lift the aircraft, you must put them in position on a satisfactory base. The surface must be flat and the jack must be plumb in place.

2. Inspections
Do an inspection of the area of each jacking point that you will use. Make sure there is no damage and that each jacking point is serviceable.

3. Job Setup References
For jacking point locations, see DESC 06-30-00-001-A01.
For general data on jack adaptors, see FIGURE 06-30-00-991-004-B.

4. Job Set-up Information

A. Fixtures, Tools, Test and Support Equipment

REFERENCE	DESIGNATION
98F07103500001	ADAPTOR-JACK NOSE
98F07104000002	PAD-JACKING, SET-WING
98F07108635000	ADAPTER - JACKING, AFT JACKING POINT

Fixtures, Tools, Test and Support Equipment

TABLE 1

B. Referenced Information

REFERENCE	DESIGNATION
DESC 06-30-00-001-A01	DESC 06-30-00-001-A01-General
FIGURE 06-30-00-991-004-B	FIGURE 06-30-00-991-004-B-Installation of the Jack Adaptors

Referenced Information

TABLE 2

5. Procedure

WARNING : YOU MUST MONITOR AIRCRAFT STABILITY, WEIGHT AND CG DURING THE RECOVERY PROCESS.

CAUTION : YOU CAN USE ALL COMBINATIONS OF THE JACKING POINTS (ONE OR MORE) TO LEVEL/LIFT THE AIRCRAFT. THE JACK LOADS AT EACH JACKING POINT MUST NOT BE MORE THAN THE ALLOWABLE LOADS (VERTICAL (FZ) AND HORIZONTAL (FH).

CAUTION : YOU MUST NOT USE THE SAFETY STAY TO LEVEL OR LIFT THE AIRCRAFT.

CAUTION : BEFORE YOU LIFT OR YOU LOWER THE AIRCRAFT MAKE SURE THAT THERE IS NO EQUIPMENT ADJACENT TO IT THAT CAN CAUSE DAMAGE. MAKE SURE THAT NO OTHER WORK IS BEING DONE.

NOTE : The information or principles contained in this chapter are given as a guide to assist an aircraft recovery.

Subtask 06-30-00-581-003-A01

A. Installation of the jack adaptors

(1) At the FWD jacking point:
See FIGURE 06-30-00-991-004-B.

(a) Examine the 98F07103500001 ADAPTOR-JACK NOSE (1) and make sure that there is no damage.

WARNING : BE CAREFUL WHEN YOU USE SOLVENTS/CLEANING AGENTS, SEALANTS AND OTHER MATERIALS. OBEY THE MATERIAL MANUFACTURER'S INSTRUCTIONS AND THE LOCAL REGULATIONS. MAKE SURE THAT THERE IS A GOOD FLOW OF AIR THROUGH THE WORK AREA. DO NOT BREATHE THE FUMES. DO NOT SMOKE. DO NOT USE THESE MATERIALS NEAR A FLAME, SPARKS OR SOURCES OF HEAT. USE PROTECTIVE CLOTHING, GOGGLES AND GLOVES. IF YOU GET ONE OF THESE MATERIALS ON YOUR SKIN OR IN YOUR EYES, FLUSH IT AWAY WITH A FLOW OF CLEAN WATER. IF YOU GET ONE OF THESE MATERIALS IN YOUR MOUTH, GET IMMEDIATE MEDICAL AID. IN GENERAL, THESE MATERIALS ARE POISONOUS, FLAMMABLE AND SKIN IRRITANTS.

(b) Apply Material No. 04-004 on the 98F07103500001 ADAPTOR-JACK NOSE (1).

(c) Install the 98F07103500001 ADAPTOR-JACK NOSE (1) at the FWD jacking point.

(2) At the wing Jacking Points
See FIGURE 06-30-00-991-004-B.

(a) Remove the blanking plugs from the wing.

(b) Put the 98F07104000002 PAD-JACKING, SET-WING (2) in position under the wing and install the bolt (3). Do not tighten it at this step.

(c) Install the bolts (4). Do not tighten it at this step.

(d) Tighten the bolt (3), then tighten the bolts (4).

(3) At the Auxiliary Jacking Point
See FIGURE 06-30-00-991-004-B

(a) Remove the cap blanking from the jacking safety point.

(b) Install the 98F07108635000 ADAPTER - JACKING, AFT JACKING POINT (5) at the safety stay point.

Subtask 06-30-00-581-004-A01

B. Removal of the Jack Adaptors

(1) At the FWD jacking point:
See FIGURE 06-30-00-991-004-B.

(a) Remove the 98F07103500001 ADAPTOR-JACK NOSE (1) from the FWD jacking point.

(2) At the wing jacking points
See FIGURE 06-30-00-991-004-B.

(a) Remove the 98F07104000002 PAD-JACKING, SET-WING (2) from the wing jacking point.

(b) Remove the bolts (4), then remove the bolt (3).

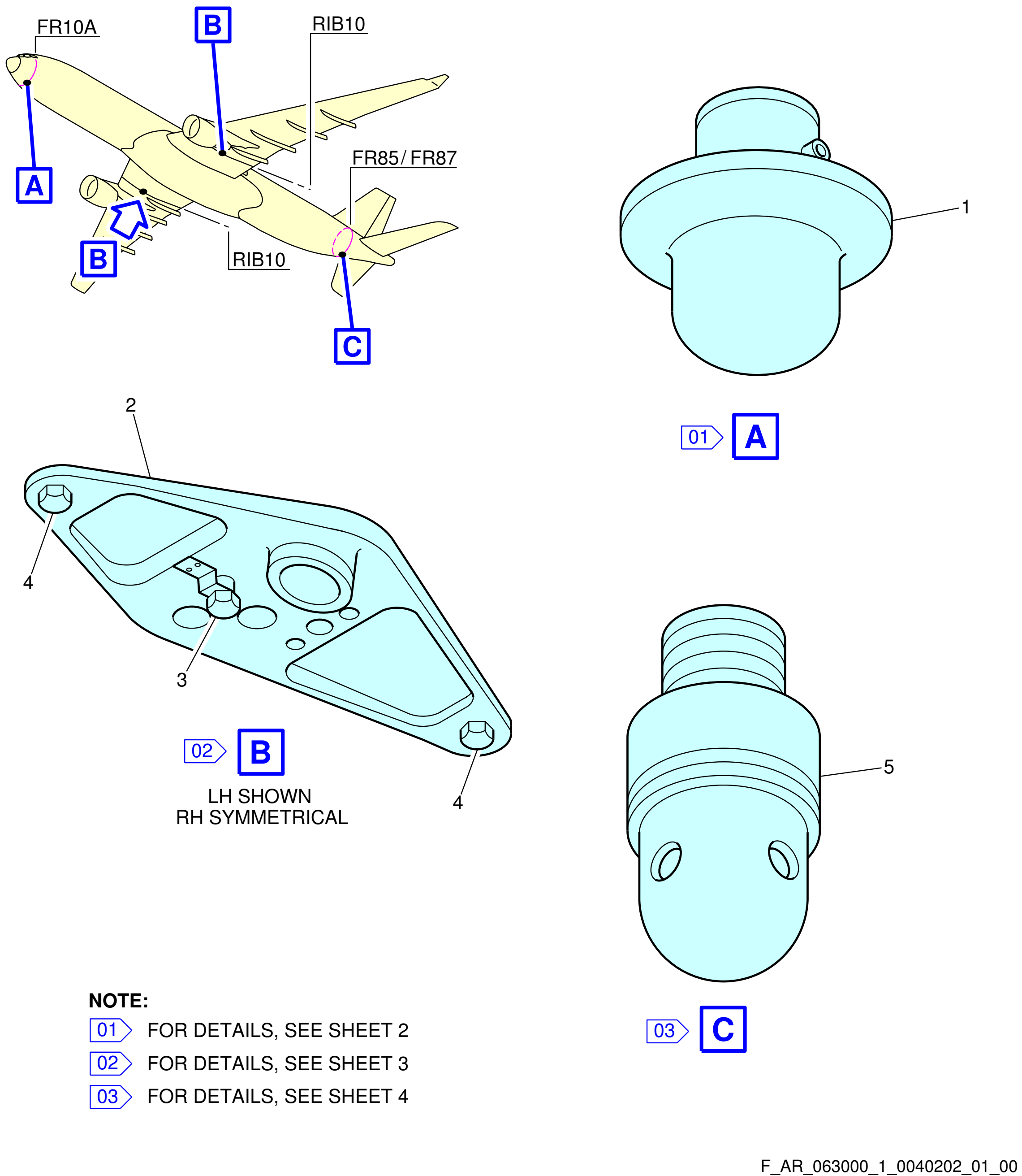
(c) Install the blanking plugs on the wing.

(3) At the Auxiliary Jacking Point
See FIGURE 06-30-00-991-004-B.

(a) Remove the 98F07108635000 ADAPTER - JACKING, AFT JACKING POINT (5) at the safety stay point.

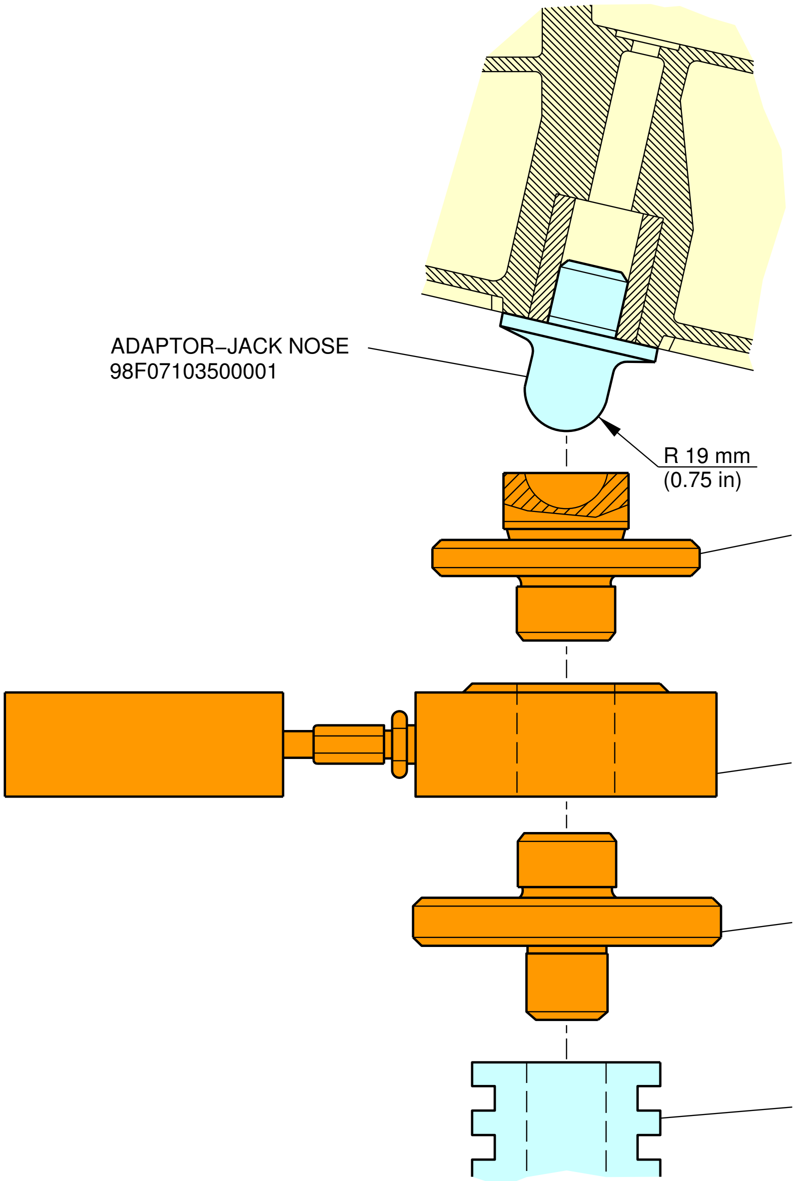
(b) Install the cap blanking on the jacking safety point.

**ON A/C A330-200 A330-300



Installation of the Jack Adaptors
General (Sheet 1 of 4)
FIGURE-06-30-00-991-004-B01

**ON A/C A330-200 A330-300



NOTE: INSTALLATION LAYOUT IS FOR INFORMATION ONLY.
FOR INSTALLATION ATTACHMENT ANGLES, SEE ASSEMBLY DRAWINGS.

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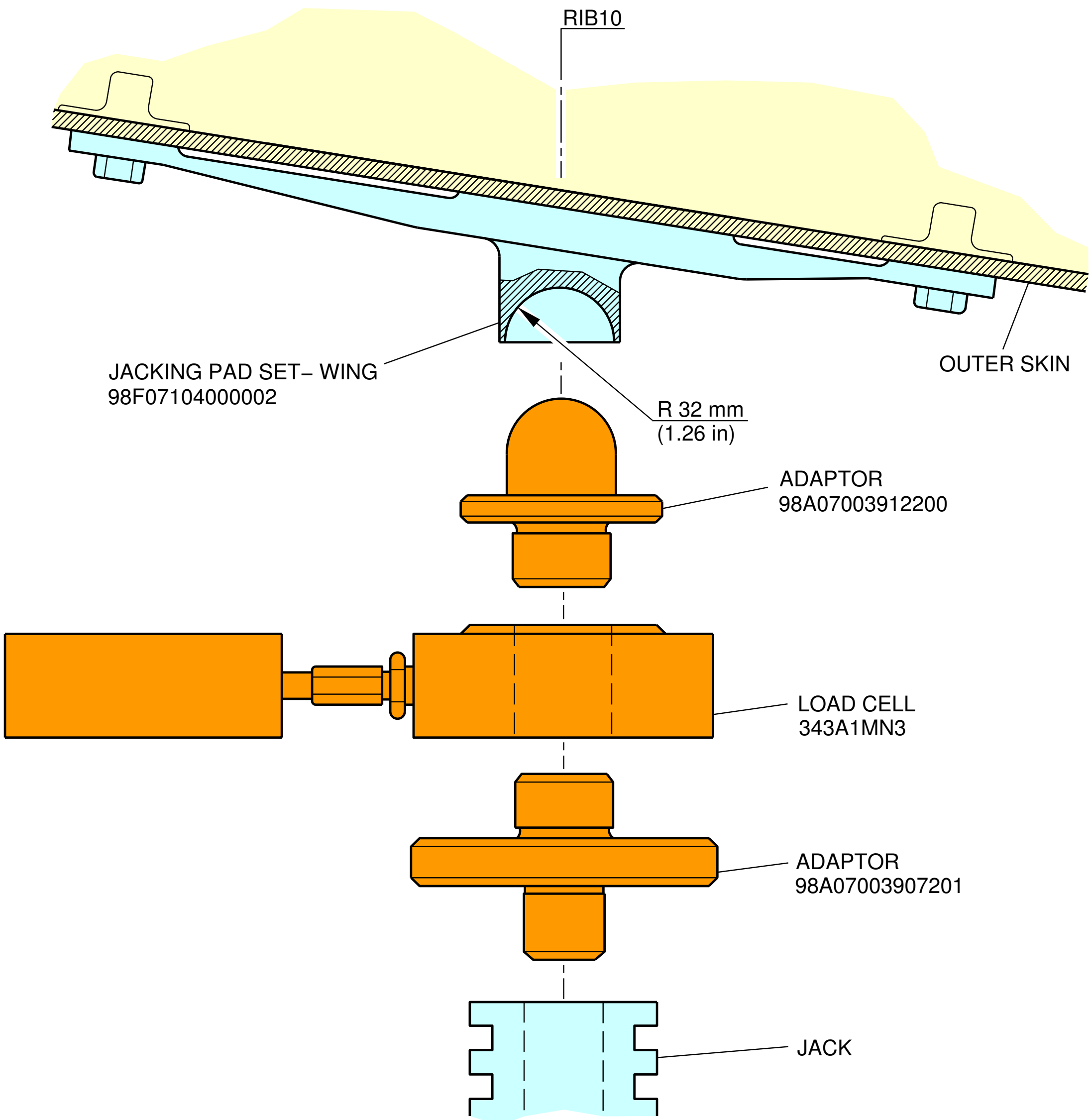
Installation of the Jack Adaptors
Forward Jacking Point (Sheet 2 of 4)
FIGURE-06-30-00-991-004-B01

**ON A/C A330-200 A330-300



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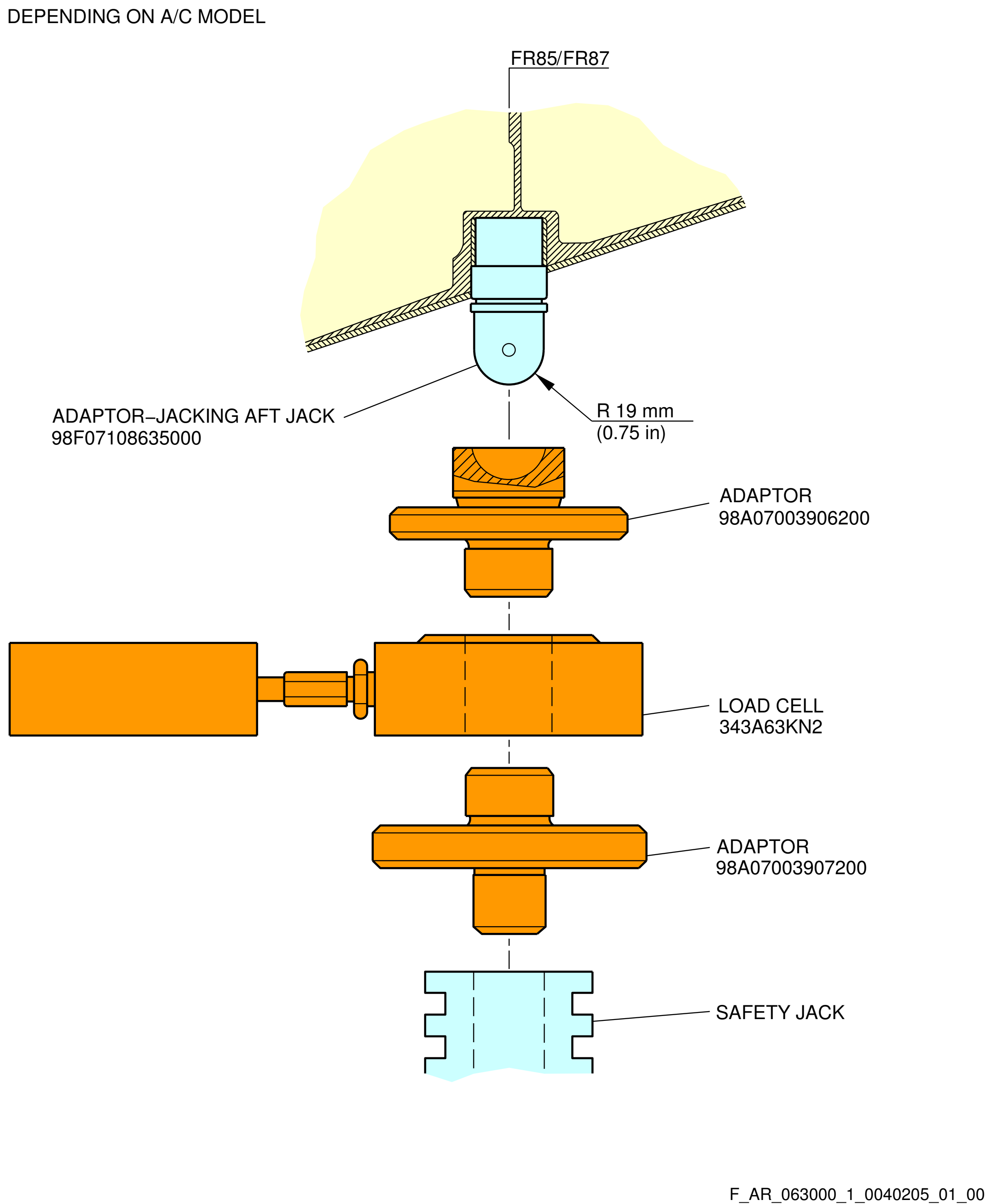
Installation of the Jack Adaptors
Wing Jacking Point (Sheet 3 of 4)
FIGURE-06-30-00-991-004-B01

**ON A/C A330-200 A330-300



Installation of the Jack Adaptors
Auxiliary Jacking Point - Safety Stay (Sheet 4 of 4)
FIGURE-06-30-00-991-004-B01

**ON A/C A330-200 A330-300

TASK 06-30-00-581-801-A01

General Preparation and Instructions for Leveling and Lifting the Aircraft with Jacks

1. General
   This section gives the data related to the use of jacks to level and lift the aircraft: allowable loads, general preparation and instructions.

   NOTE : If you use jacks to level or lift the aircraft, you must put them in position on a satisfactory base. The surface must be flat and the jack must be plumb in place.

2. Inspections
   Not Applicable.

3. Job Setup References

   A. Aircraft Jacking Stability
      When you use jacks to level or lift the aircraft, you must put them in position on a satisfactory base. The surface must be flat and the jack must be plumb when it is in position. The load bearing capacity of the soil must support the loads applied at the jack footprint.
      You can use plywood sheets with steel plates on top to make the ground more rigid. In some conditions, it can be necessary to excavate and prepare a base of coarse gravel before you place the plywood sheets and steel plates.

4. Job Set-up Information

   A. Referenced Information

REFERENCE	DESIGNATION
TASK 06-10-00-970-801-A01	TASK 06-10-00-970-801-A01-Vertical Loads Determination
TASK 06-10-00-970-803-A01	TASK 06-10-00-970-803-A01-Arc Movement Calculation
TASK 06-10-00-970-802-A01	TASK 06-10-00-970-802-A01-Side loads on Jack Fittings Determination
TASK 02-20-02-285-801-A01	TASK 02-20-02-285-801-A01-Initial Site Survey
DESC 06-30-00-001-A01	DESC 06-30-00-001-A01-General
04-30-00	04-30-00-TETHERING THE AIRCRAFT
03-50-01	03-50-01-MANAGING AIRCRAFT WEIGHT AND CG
	05-50-01-CARGO REMOVAL
05-60-00	05-60-00-REMOVAL OF LARGE COMPONENTS
02-30-01	02-30-01-LANDING GEAR
07-60-00	07-60-00-MOVING DAMAGED AIRCRAFT
06-60-00	06-60-00-LEVELING AND LIFTING SCENARIOS
AMM 07-11-00-581-801	
AMM 07-11-00-480-051	
FIGURE 06-30-00-991-008-A	FIGURE 06-30-00-991-008-A-Aircraft on Jacks
FIGURE 06-30-00-991-008-B	FIGURE 06-30-00-991-008-B-Aircraft on Jacks

REFERENCE	DESIGNATION
FIGURE 06-30-00-991-008-A	FIGURE 06-30-00-991-008-A-Aircraft on Jacks
FIGURE 06-30-00-991-008-B	FIGURE 06-30-00-991-008-B-Aircraft on Jacks

Referenced Information

TABLE 1

5. Procedure

CAUTION : MAKE SURE THAT THE LOADS APPLIED AT EACH JACKING POINT ARE NOT MORE THAN THE MAXIMUM ALLOWABLE LOADS.

CAUTION : WHEN YOU LEVEL/LIFT THE AIRCRAFT, YOU MUST CONTINUOUSLY MONITOR AND RECORD THE LOADS AND MAKE SURE THAT THE LOADS YOU APPLY ARE NOT MORE THAN THE MAXIMUM ALLOWABLE LOADS. IF THE LOADS ARE MORE THAN THE ALLOWABLE LOADS, THIS CAN CAUSE DAMAGE TO THE AIRCRAFT STRUCTURE.

CAUTION : IF THE LOADS APPLIED DURING THE RECOVERY PROCEDURE ARE MORE THAN THE MAXIMUM ALLOWABLE LOADS, YOU MUST CONTACT AIRBUS FOR SPECIFIC INSPECTIONS.

CAUTION : YOU CAN USE ALL COMBINATIONS OF THE JACKING POINTS (ONE OR MORE) TO LEVEL/LIFT THE AIRCRAFT. THE JACK LOADS AT EACH JACKING POINT MUST NOT BE MORE THAN THE ALLOWABLE LOADS (VERTICAL (FZ) AND HORIZONTAL (FH).

CAUTION : YOU MUST CORRECTLY TETHER THE AIRCRAFT BEFORE YOU LEVEL OR LIFT IT.

NOTE : The information or principles contained in this chapter are given as a guide to assist an aircraft recovery.

****ON A/C A330-200**

Subtask 06-30-00-581-005-B01

A. Jacking Preparation

(1) General
See TASK 06-30-00-581-802-A01 for data about the installation of a jack adaptor.
The maximum jacking weight is 152 000 kg (335 103 lb).
When you lift the aircraft with three jacks, the weight of the aircraft must not be more than the maximum jacking weight. The maximum jacking weight is not applicable for leveling with one or two jacks but the load on each jack must not be more than the maximum allowable loads.

When you lift the aircraft with jacks, it is necessary to monitor the loads at the related jacking points.
You must also make sure that the wind speed is not more than the maximum allowable speed. See FIGURE 06-30-00-991-008-A.

(2) Jacking Data
The table below gives jacking data for each jacking point:
- Aircraft level: height necessary to bring the aircraft to a level attitude.
- Arc Movement: longitudinal movement of the jacking point during the jacking operation.
- Aircraft Jacked, FDL = 6.500 m (21.33 ft): height necessary to extend the landing gears.
- Aircraft Jacked, FDL = 7.200 m (23.62 ft): height necessary to replace a landing gear.

	Leveling		Lifting	
	Aircraft level	Arc Movement (Depending on attitude)	Aircraft Jacked FDL = 6.500 m (21.33 ft)	Aircraft Jacked FDL = 7.200 m (23.62 ft)
FWD Jacking Point	2.594 m (8.51 ft)	See applicable scenario in 06-60-00	4.365 m (14.32 ft)	5.065 m (16.62 ft)
RH/LH Wing Jacking Point	4.460 m (14.63 ft)		5.800 m (19.03 ft)	6.500 m (21.33 ft)
Safety Stay	5.688 m (18.66 ft)	-	6.384 m (20.94 ft)	7.084 m (23.24 ft)

Jacking Data

TABLE 2

****ON A/C A330-300**

Subtask 06-30-00-581-005-C01

A. Jacking Preparation

(1) General
See TASK 06-30-00-581-802-A01 for data about the installation of a jack adaptor.
The maximum jacking weight is 152 000 kg (335 103 lb).
When you lift the aircraft with three jacks, the weight of the aircraft must not be more than the maximum jacking weight. The maximum jacking weight is not applicable for leveling with one or two jacks but the load on each jack must not be more than the maximum allowable loads.
When you lift the aircraft with jacks, it is necessary to monitor the loads at the related jacking points.

You must also make sure that the wind speed is not more than the maximum allowable speed. See FIGURE 06-30-00-991-008-B.

(2) Jacking Data

The tables below give jacking data for each jacking point:

- Aircraft level: height necessary to bring the aircraft to a level attitude.
- Arc Movement: longitudinal movement of the jacking point during the jacking operation.
- Aircraft Jacked, FDL = 6.500 m (21.33 ft): height necessary to extend the landing gears.
- Aircraft Jacked, FDL = 7.200 m (23.62 ft): height necessary to replace a landing gear.

(a) Valid for Aircraft Models STD6 (WV000-014)

	Leveling		Lifting	
	Aircraft level	Arc Movement (Depending on attitude)	Aircraft Jacked FDL = 6.500 m (21.33 ft)	Aircraft Jacked FDL = 7.200 m (23.62 ft)
FWD Jacking Point	2.518 m (8.26 ft)	See applicable scenario in 06-60-00	4.365 m (14.32 ft)	5.065 m (16.62 ft)
RH/LH Wing Jacking Point	4.460 m (14.63 ft)		5.800 m (19.03 ft)	6.500 m (21.33 ft)
Safety Stay	5.391 m (17.69 ft)	-	6.060 m (19.88 ft)	6.760 m (22.18 ft)

Jacking Data

TABLE 3

(b) Valid for Aircraft Models STD8 (WV020-0534)

	Leveling		Lifting	
	Aircraft level	Arc Movement (Depending on attitude)	Aircraft Jacked FDL = 6.500 m (21.33 ft)	Aircraft Jacked FDL = 7.200 m (23.62 ft)
FWD Jacking Point	2.518 m (8.26 ft)	See applicable scenario in 06-60-00	3.951 m (12.96 ft)	4.651 m (15.26 ft)
RH/LH Wing Jacking Point	4.460 m (14.63 ft)		5.387 m (17.67 ft)	6.087 m (19.97 ft)
Safety Stay	5.391 m (17.69 ft)	-	5.647 m (18.53 ft)	6.347 m (20.82 ft)

Jacking Data

TABLE 4

ON A/C A330-200 A330-300

Subtask 06-30-00-581-002-A01

B. General

NOTE : Before you start to level or lift the aircraft with jacks, you must make sure that the personnel know the instructions and conditions below and that they obey these instructions and conditions.

(1) Do not level or lift the aircraft with jack(s) in gusty wind conditions.

(2) Do not lift the aircraft with jacks during steady wind conditions.

(3) Find the maximum allowable wind speed related to your aircraft configuration. See FIGURE 06-30-00-991-008-AFIGURE 06-30-00-991-008-B.

(4) Correctly tether the aircraft before leveling or lifting with jacks. This is to prevent aircraft movement that you cannot control during the leveling or lifting operation. See 04-30-00.

(5) Read the manufacturer instructions related to the special jack(s) used.

(6) Only the personnel who knows the operation of jacks and aircraft jacking procedures are in charge of the jacking operation.

(7) Confirm the NRW and CG position. See 03-50-01.

(8) Calculate the anticipated vertical load on each jacking point to be used to make sure this load is not more than the maximum allowable load. (See TASK 06-10-00-970-801-A01 and DESC 06-30-00-001-A01)
If the necessary load on the jacking point is more than the allowable load for that jacking point, reduce the aircraft weight until the lifting load is less than the allowable load or make a selection of different leveling or lifting procedure.

(9) Make sure each available jack can support the necessary load (vertical and side), arc movement and travel range. Also make sure it can be put in the boundaries of the fuselage or wing jacking points.
To reduce the necessary lifting load, it is recommended to reduce the aircraft weight with the removal of cargo or payload from the aircraft before a leveling or lifting operation (See and 05-60-00).

(10) Calculate the expected arc movement at each jacking point during the leveling operation. (See TASK 06-10-00-970-803-A01)
Calculate the side load if necessary. (See TASK 06-10-00-970-802-A01)

(11) If the jack cannot move along the necessary arc movement, you must calculate the expected side load on the jacking point and make sure the expected side load is not more than the allowable load on the jacking point.

(12) Install fittings and/or jack pad adapters at the necessary jacking points. See TASK 06-30-00-581-802-A01.

(13) If necessary, excavate a sufficiently large area to make a stable platform as a base for each jack. Make sure that the ground/soil can support the load at each jack footprint, and that will stay stable during the leveling or lifting operation. See TASK 02-20-02-285-801-A01)
Make a platform that is satisfactory for the jack height when in compressed position. Make sure that the platform is sufficiently large to change the position of the jack during the leveling operation if necessary. If the jack in the extended position cannot lift the aircraft sufficiently, it is necessary to make a timber platform that is sufficiently high.

(14) Put wheel chocks in front of and behind the wheels of each extended landing gear in contact with the ground.

(15) Install the landing gear downlock pins in all extended landing gears. See 02-30-01.

(16) Put each jack in position below the jacking point and extend the jack to engage it in the fitting.

(17) Before you start the jacking operation, we recommend that you mark the values of the necessary lifting load to be applied on the jack on each load cell indicator (use a strip of colored adhesive tape for example).
Also, we recommend that you mark the maximum allowable load of each jacking point to prevent overload. This gives the recovery personnel better visibility from the ground.

(18) Each jack operator must have a good visibility to the person in charge of the lifting operation.
Coordination between all jack operators is very important. Two-way voice activated headsets are very good for this type of operation.

(19) You must use and monitor plumb bobs and levels during a leveling or lifting operation.

(20) Monitor the CG during the full leveling procedure and be prepared to control with ballast if necessary. See 03-50-01.

(21) If you use tethers, they must be adjusted and the loads must be monitored when you level or lift the aircraft.

(22) Install aft tipping protection if necessary.

(23) When you use a jack at the safety stay position to make the aircraft stable, you must monitor the jack and correctly adjust the loads.

(24) Make sure the loads at each jack are not more than the allowable loads and that you record all the loads applied. See DESC 06-30-00-001-A01.

(25) Level the aircraft:

(a) With a special recovery jack:
If you use a special recovery jack that can move along the arc movement, make sure the jack can do the necessary arc movement to level the aircraft. Include side loads caused by the jack.
If the jack can do the total necessary arc movement, gradually level the aircraft in small steps and change the position of the jack between each step.

(b) With a standard jack:
If the jack cannot sufficiently move along the arc movement or if you use a standard jack, gradually level the aircraft in small steps and change the position of the jack between each step.

NOTE : If possible, you should use a special recovery jack. Step by step leveling is not the recommended method to level the aircraft.

- Start jacking until you get the maximum jack extension or maximum arc movement.
- Lock the jack at this position and make sure the aircraft is in a stable configuration.
- At the same time, make shoring under the closest load bearing frame or frames and make sure the loads are not more the maximum allowable loads.
- Compress the jack, make the necessary stable-base platform and change the position of the jack. Do the procedure again until the aircraft is level.

(26) It is possible to use axle jacks with shoring and timber bases at the primary jacking points to lift the aircraft to the height where recovery jacks can be fitted. This is not a recommended procedure because of the limited arc movement capacity of the jack.

(27) When the fuselage and wings are level, and if it is necessary to lift the aircraft, use the 3 primary jacking points to lift the aircraft to the necessary height. (See AMM 07-11-00-581-801)
Do not lift the aircraft until all the aircraft (wings and fuselage) is in a level attitude. (SeeAMM 07-11-00-480-051 for the necessary lifting heights)

(28) When the aircraft is at the necessary height:

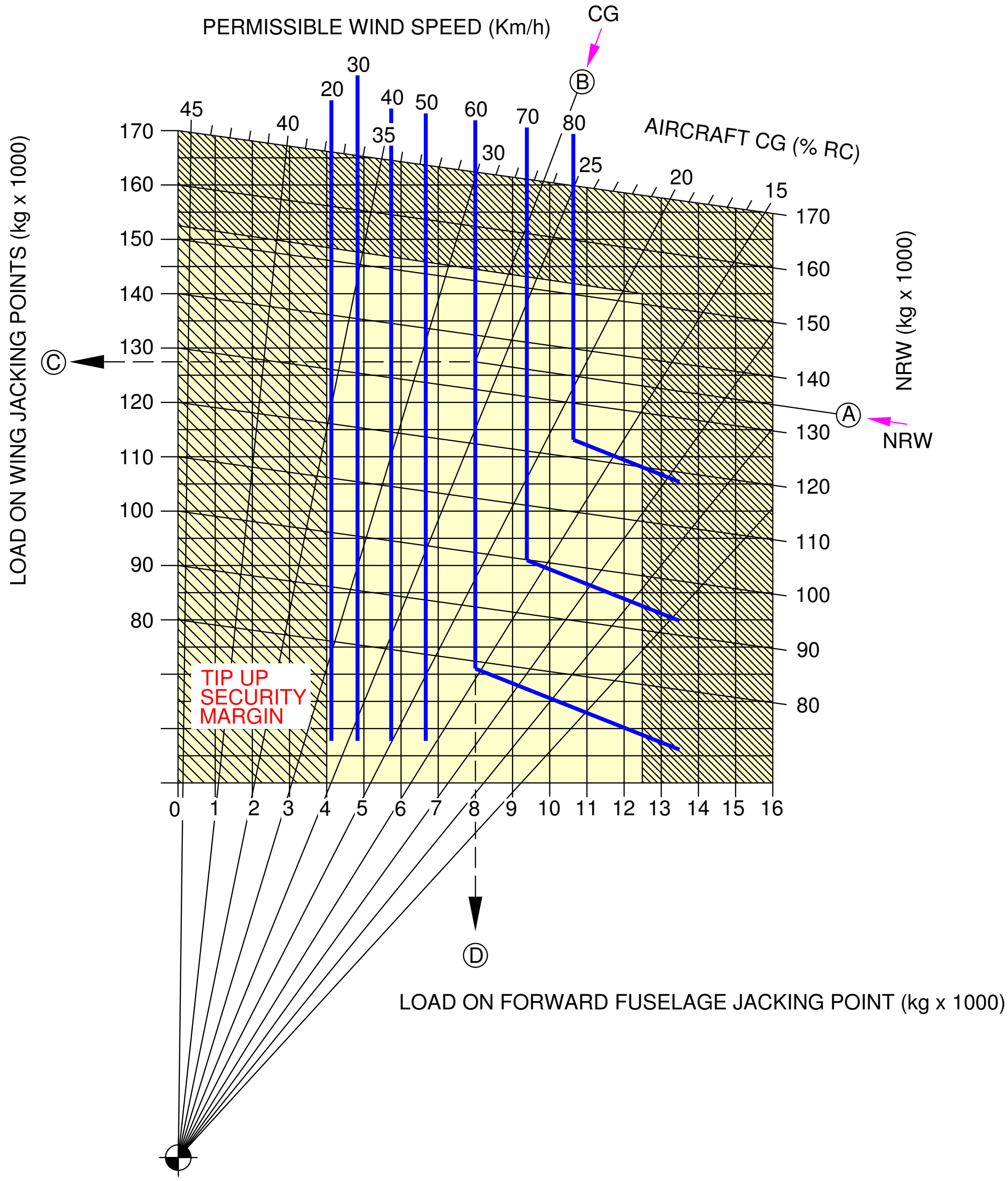
(a) Make shoring to support the fuselage and/or wings, or leave the jacks in place as a safety measure during work on the landing gears.

(b) Extend the landing gear(s) and install the downlock pin(s).

(c) Or repair or replace the landing gear(s).

(d) Or, if it is not possible to make the landing gear(s) serviceable, place the forward fuselage and/or the wing(s) on a mobile device. See 07-60-00.

**ON A/C A330-200



EXAMPLE : ASSUME AIRCRAFT WITH NRW OF 135000 kg (A) AND CENTER OF GRAVITY AT 26.5% RC (B). THE REACTION AT THE WING JACKING POINTS IS 127000 kg (63500 kg PER SIDE) (C) AND THE REACTION AT THE FORWARD FUSELAGE JACKING POINT IS 8000 kg (D). IF THE AIRCRAFT MUST BE LIFTED OUTSIDE THE WIND SPEED MUST NOT BE IN EXCESS OF 60 Km/h..

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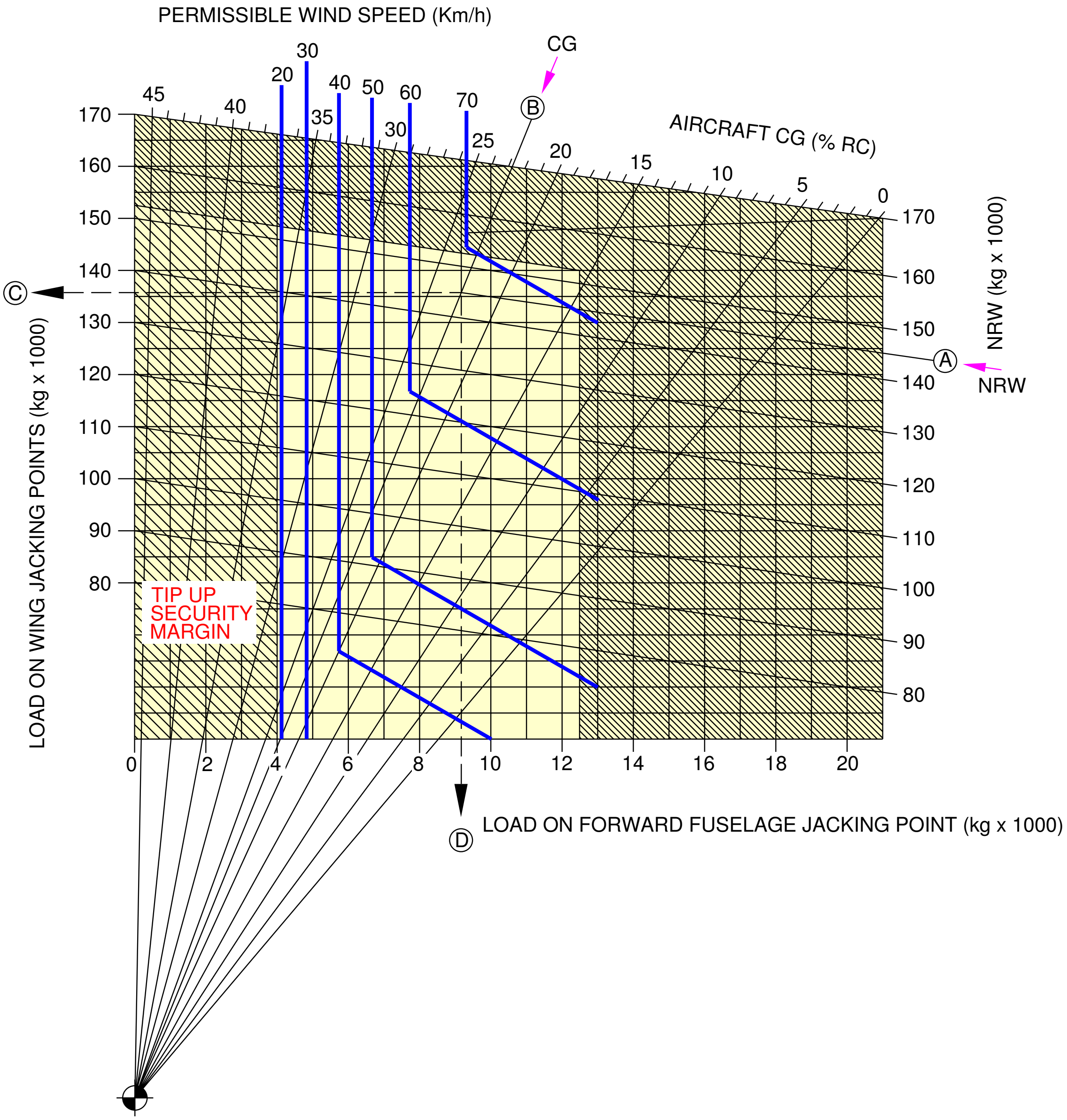
Aircraft on Jacks
Stability and Maximum Wind Speed
FIGURE-06-30-00-991-008-A01

**ON A/C A330-300



EXAMPLE : ASSUME AIRCRAFT WITH NRW OF 145000 kg A AND CENTER OF GRAVITY AT 22.8% RC B. THE REACTION AT THE WING JACKING POINTS IS 136000 kg (68000 kg PER SIDE) C AND THE REACTION AT THE FORWARD FUSELAGE JACKING POINT IS 9000 kg D. IF THE AIRCRAFT MUST BE LIFTED OUTSIDE THE WIND SPEED MUST NOT BE IN EXCESS OF 60 Km/h..

F_AR_063000_1_0080201_01_00

Aircraft on Jacks
Stability and Maximum Wind Speed
FIGURE-06-30-00-991-008-B01

06-40 USE OF PNEUMATIC LIFTING BAGS

06-40-00 USE OF PNEUMATIC LIFTING BAGS

ON A/C A330-200 A330-300

DESC 06-40-00-002-A01

General

1. This section gives data about the use of pneumatic lifting bags for leveling and lifting : location of bearing areas, allowable loads, general preparation and instructions.
   Pneumatic lifting bags have different sizes and lifting capacities. In general, multiple-element pneumatic lifting bags with internal drop threads are the most usual. Single-element pneumatic lifting bags (balloon bags) are not recommended.
   You must know and obey the operating instructions given by the manufacturer of the pneumatic lifting bags.

ON A/C A330-200 A330-300

DESC 06-40-00-001-A01

Pneumatic Lifting Bags on Fuselage

ON A/C A330-200

1. Fuselage Bearing Areas

CAUTION : MAKE SURE THAT THE PNEUMATIC LIFTING BAGS APPLY LOADS IN THE BEARING AREA ONLY. IF THE LIFTING BAGS APPLY LOADS OUT OF THE LIMITS OF THE BEARING AREA, SECONDARY DAMAGE CAN OCCUR.

CAUTION : DO NOT PUT THE LIFTING BAGS UNDER PROTRUDING STRUCTURES (FLAP TRACKS,PYLON FAIRINGS, ETC.), SHARP EDGES OR ANGLES BECAUSE THEY CAN CAUSE DAMAGE TO THE LIFTING BAGS.

CAUTION : MAKE SURE THAT THE LOADS ON THE AIRFRAME ARE LESS THAN THE ALLOWABLE LOADS WHEN YOU USE SUPPORTS. THE SUPPORTS APPLY LOADS THAT DO NOT OCCUR IN NORMAL OPERATION.

CAUTION : MAKE SURE THAT THE PNEUMATIC LIFTING BAGS DO NOT APPLY LOADS ON THE BELLY FAIRING STRUCTURE. IF NECESSARY, REMOVE THE BELLY FAIRINGS AND THE BELLY FAIRING STRUCTURE TO GET ACCESS TO THE ALLOWABLE BEARING AREA.

This part gives data about the installation of pneumatic lifting bags under the fuselage

A. Location

Pneumatic lifting bags can be installed under the fuselage between FR21 and FR37 and between FR55 and FR59 with a minimum width of 1.5 m (60 in) and a minimal contact area of two frame bays and 16 stringer bays, see FIGURE 06-40-00-991-002-A.
Before you install the pneumatic lifting bags, you must check that there is no damage on the bearing area.

NOTE : Some items (drains, antennas, etc.) can prevent pneumatic lifting bag installation or cause damage to them. Thus, you must remove these items before you install the lifting bags. See DESC 06-00-00-002-A01 for the list of leveling/lifting obstructions.

B. Allowable Loads

Bearing Area	Maximum Allowable Pressure		
	PSI	hPa	Bar
FR21 to FR37	4.93	340	0.34
FR55 A to FR59	4.49	310	0.31

Maximum Allowable Pressure

TABLE 1

NOTE : If the aircraft cabin pressure boundaries are not damaged, pressurization of the cabin can increase the maximum allowable pressure of lifting bags. It is possible to add the cabin pressure applied to the maximum allowable pressure of lifting bags.

See 06-10-00 for load calculation and pneumatic lifting bag pressure calculation related to the aircraft attitude and the leveling/lifting procedure selection.

****ON A/C A330-300**

2. Fuselage Bearing Areas

CAUTION : MAKE SURE THAT THE PNEUMATIC LIFTING BAGS APPLY LOADS IN THE BEARING AREA ONLY. IF THE LIFTING BAGS APPLY LOADS OUT OF THE LIMITS OF THE BEARING AREA, SECONDARY DAMAGE CAN OCCUR.

CAUTION : DO NOT PUT THE LIFTING BAGS UNDER PROTRUDING STRUCTURES (FLAP TRACKS,PYLON FAIRINGS, ETC.), SHARP EDGES OR ANGLES BECAUSE THEY CAN CAUSE DAMAGE TO THE LIFTING BAGS.

CAUTION : MAKE SURE THAT THE LOADS ON THE AIRFRAME ARE LESS THAN THE ALLOWABLE LOADS WHEN YOU USE SUPPORTS. THE SUPPORTS APPLY LOADS THAT DO NOT OCCUR IN NORMAL OPERATION.

CAUTION : MAKE SURE THAT THE PNEUMATIC LIFTING BAGS DO NOT APPLY LOADS ON THE BELLY FAIRING STRUCTURE. IF NECESSARY, REMOVE THE BELLY FAIRINGS AND THE BELLY FAIRING STRUCTURE TO GET ACCESS TO THE ALLOWABLE BEARING AREA.

This part gives data about the installation of pneumatic lifting bags under the fuselage

A. Location

Pneumatic lifting bags can be installed under the fuselage between FR21 and FR37 and between FR55 and FR59 with a minimum width of 1.5 m (60 in) and a minimal contact area of two frame bays and 16 stringer bays, see FIGURE 06-40-00-991-002-C.

Before you install the pneumatic lifting bags, you must check that there is no damage on the bearing area.

NOTE : Some items (drains, antennas, etc.) can prevent pneumatic lifting bag installation or cause damage to them. Thus, you must remove these items before you install the lifting bags. See DESC 06-00-00-002-A01 for the list of leveling/lifting obstructions.

B. Allowable Loads

Bearing Area	Maximum Allowable Pressure		
	PSI	hPa	Bar
FR21 to FR37	4.93	340	0.34

Bearing Area	Maximum Allowable Pressure		
	PSI	hPa	Bar
FR55 to FR59	4.64	320	0.32

Maximum Allowable Pressure

TABLE 2

NOTE : If the aircraft cabin pressure boundaries are not damaged, pressurization of the cabin can increase the maximum allowable pressure of lifting bags. It is possible to add the cabin pressure applied to the maximum allowable pressure of lifting bags.

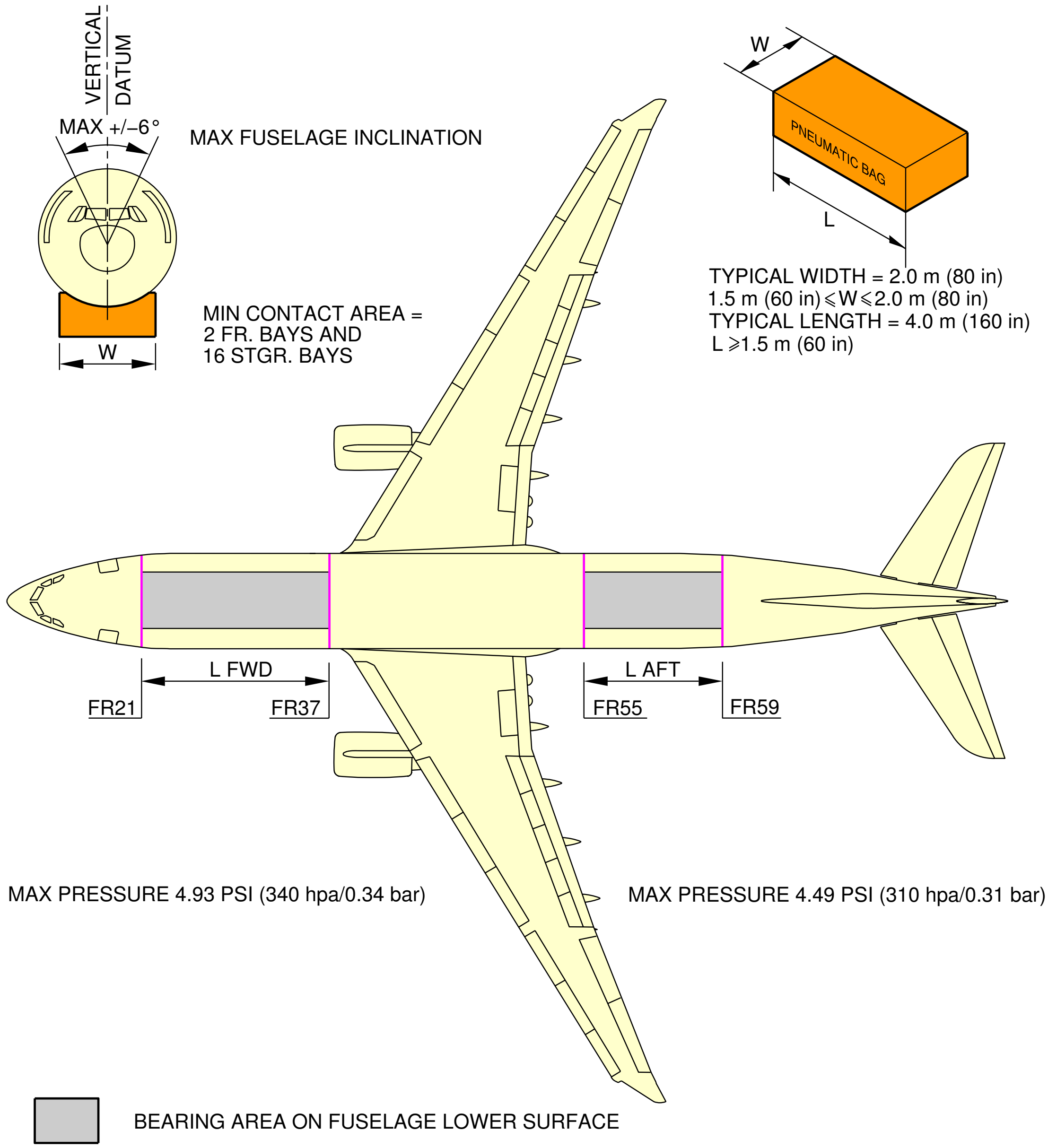
See 06-10-00 for load calculation and pneumatic lifting bag pressure calculation related to the aircraft attitude and the leveling/lifting procedure selection.

****ON A/C A330-200 A330-300**

3. Pneumatic Lifting Bag Travel Data

   Pneumatic lifting bag movement is related to the attitude of the aircraft. See 06-00-00 for data related to the applicable scenario.

**ON A/C A330-200



CAUTION: MAKE SURE THAT THE PNEUMATIC LIFTING BAGS APPLY LOADS IN THE BEARING AREA ONLY.
IF THE PNEUMATIC LIFTING BAGS APPLY LOADS OUT OF THE LIMITS OF THE BEARING AREA, SECONDARY DAMAGE CAN OCCUR.

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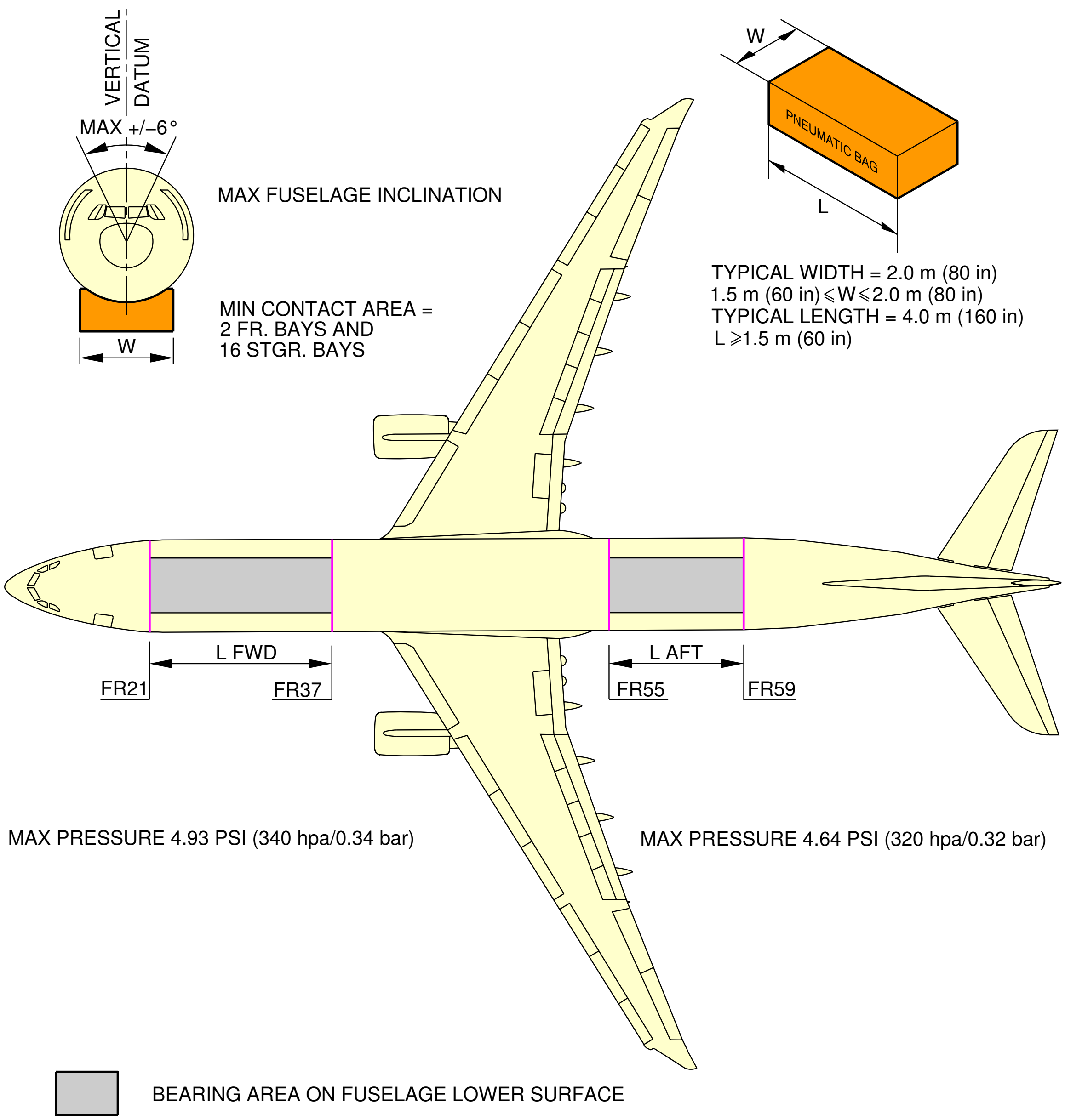
Pneumatic Lifting Bags
Fuselage Bearing Areas
FIGURE-06-40-00-991-002-A01

**ON A/C A330-300



CAUTION: MAKE SURE THAT THE PNEUMATIC LIFTING BAGS APPLY LOADS IN THE BEARING AREA ONLY. IF THE PNEUMATIC LIFTING BAGS APPLY LOADS OUT OF THE LIMITS OF THE BEARING AREA, SECONDARY DAMAGE CAN OCCUR.

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Pneumatic Lifting Bags
Fuselage Bearing Areas
FIGURE-06-40-00-991-002-C01

****ON A/C A330-200 A330-300**

DESC 06-40-00-003-A01

Pneumatic Lifting Bags on Wings

1. Bearing Areas on Wing Lower Surface

CAUTION : MAKE SURE THAT THE PNEUMATIC LIFTING BAGS APPLY LOADS IN THE BEARING AREA ONLY. IF THE LIFTING BAGS APPLY LOADS OUT OF THE LIMITS OF THE BEARING AREA, SECONDARY DAMAGE CAN OCCUR.

CAUTION : MAKE SURE THAT THE LOADS ON THE AIRFRAME ARE LESS THAN THE ALLOWABLE LOADS WHEN YOU USE SUPPORTS. THE SUPPORTS APPLY LOADS THAT DO NOT OCCUR IN NORMAL OPERATION.

CAUTION : DO NOT PUT THE LIFTING BAGS UNDER PROTRUDING STRUCTURES (FLAP TRACKS,PYLON FAIRINGS, ETC.), SHARP EDGES OR ANGLES BECAUSE THEY CAN CAUSE DAMAGE TO THE LIFTING BAGS.

This part gives data about the installation of pneumatic lifting bags under the wings.

A. Location
Pneumatic lifting bags can be installed under the wing lower surfaces between Rib 1 and Rib 27, Front Spar to Rear Spar, see FIGURE 06-40-00-991-001-A.

B. Restricted Areas
The limits of the allowable bearing areas for the pneumatic lifting bags are shown in FIGURE 06-40-00-991-003-A.

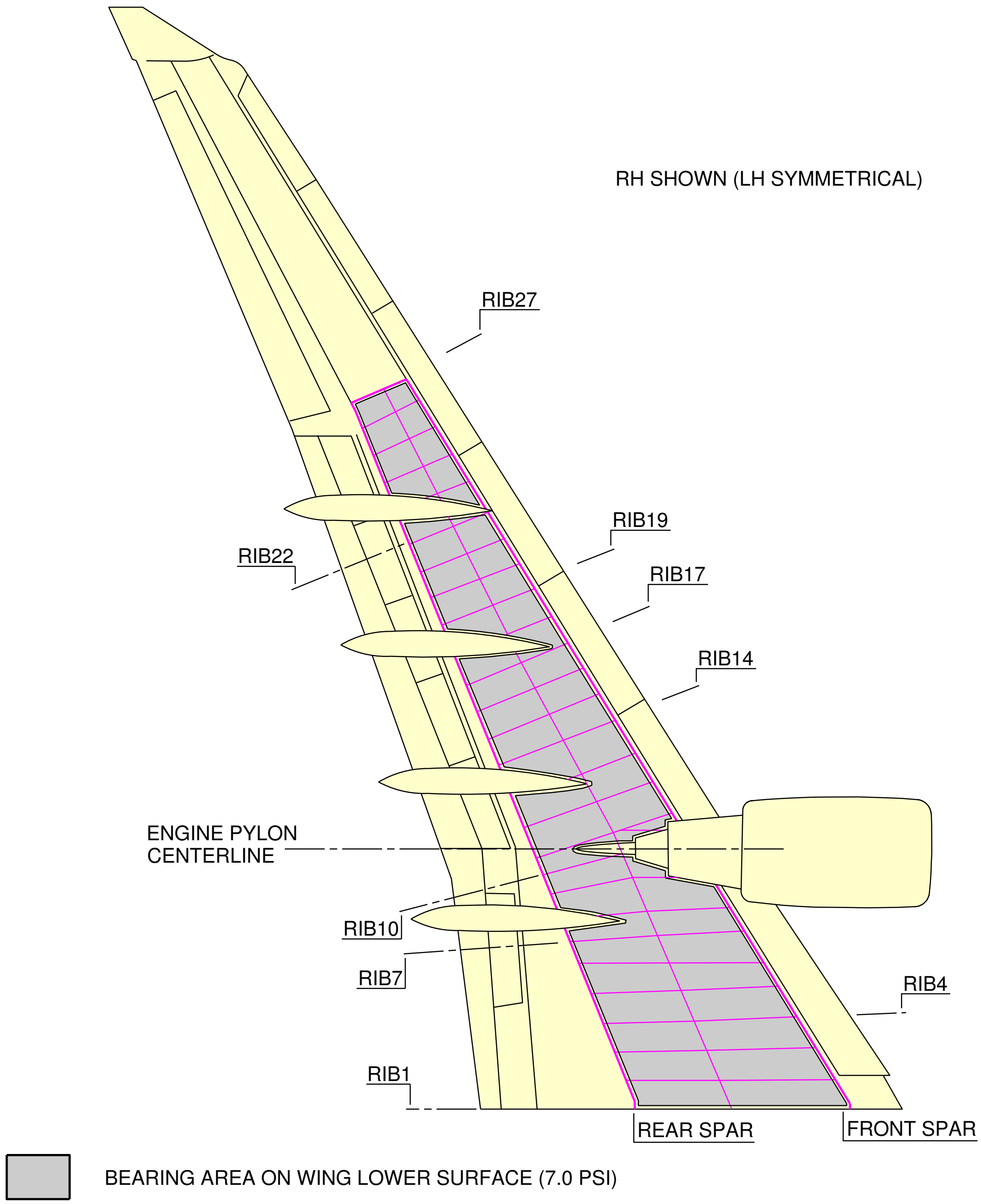
C. Allowable Loads

Bearing Area	Maximum Allowable Pressure		
	PSI	hPa	Bar
Rib 1 to Rib 27	7.0	480	0.48

Maximum Allowable Pressure

TABLE 1

**ON A/C A330-200 A330-300



CAUTION: MAKE SURE THAT THE PNEUMATIC LIFTING BAGS APPLY LOADS IN THE BEARING AREA ONLY. IF THE PNEUMATIC LIFTING BAGS APPLY LOADS OUT OF THE LIMITS OF THE BEARING AREA, SECONDARY DAMAGE CAN OCCUR.

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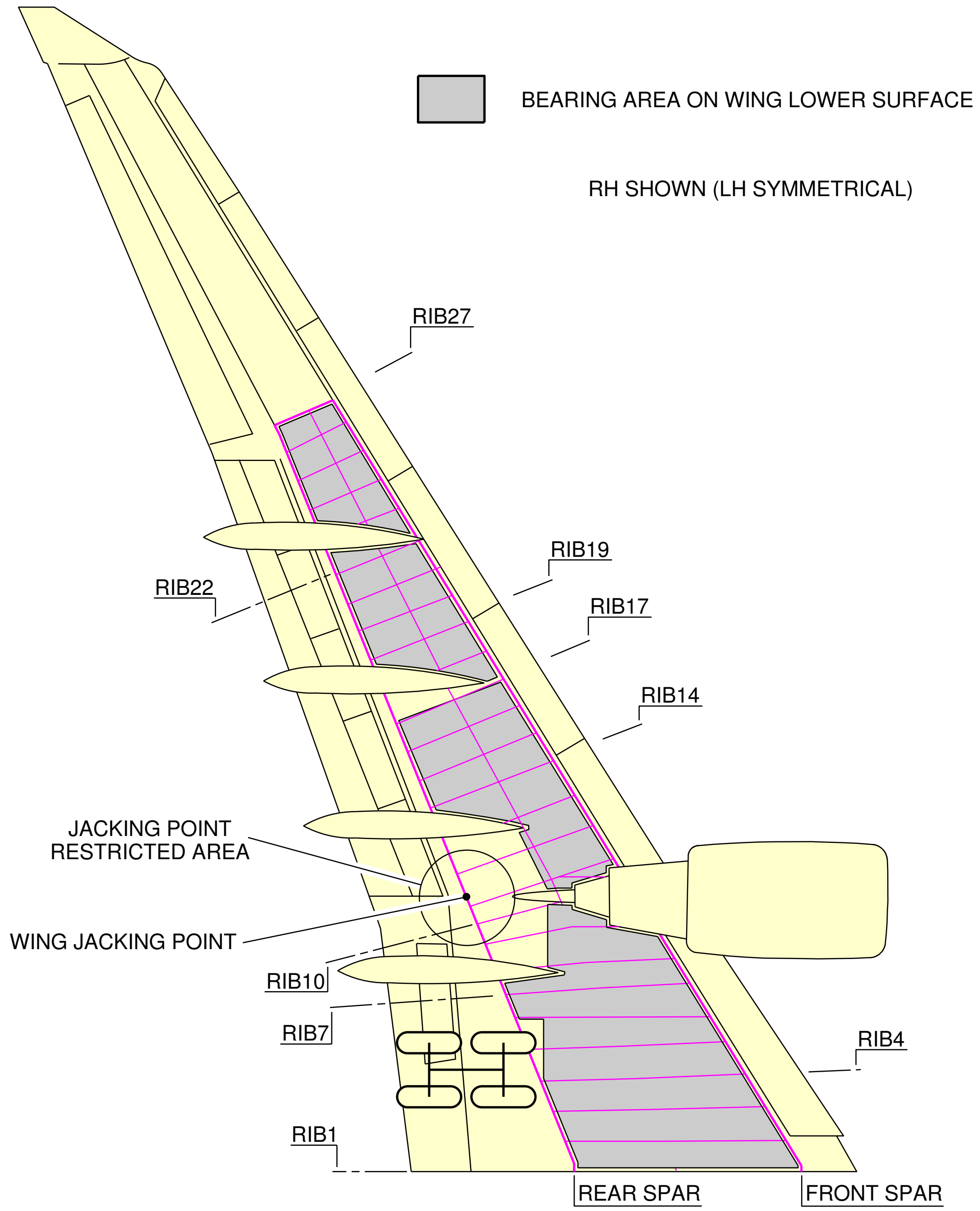
Pneumatic Lifting Bags on Wings
Bearing Area on Wing Lower Surface
FIGURE-06-40-00-991-001-A01

**ON A/C A330-200 A330-300



CAUTION: MAKE SURE THAT THE PNEUMATIC LIFTING BAGS APPLY LOADS IN THE BEARING AREA ONLY. IF THE PNEUMATIC LIFTING BAGS APPLY LOADS OUT OF THE LIMITS OF THE BEARING AREA, SECONDARY DAMAGE CAN OCCUR.

NOTE: THE JACK FOOTPRINT IS MEASURED FROM THE CENTERLINE OF THE JACK TO THE CENTERLINE OF THE TRIPOD FOOT. THE FOOTPRINT IS RELATED TO THE TYPE OF JACK. IT IS IMPORTANT TO KNOW THE FOOTPRINT OF THE JACK YOU WILL USE BEFORE YOU PUT THE LIFTING BAG(S) IN POSITION.

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Pneumatic Lifting Bags on Wings
Wing Restricted Area
FIGURE-06-40-00-991-003-A01

****ON A/C A330-200 A330-300**

TASK 06-40-00-581-801-A01

General Preparation and Instructions for Leveling and Lifting the Aircraft with Pneumatic Lifting Bags

1. General
   This section gives the data about the use of pneumatic lifting bags for leveling and lifting: allowable loads, general preparation and instructions.

   NOTE : If you use pneumatic lifting bags to level or lift the aircraft they must be put in position on a stable base. The surface must be flat.

2. Inspections
   Not Applicable.

3. Job Setup References
   Pneumatic lifting bag movement is related to the attitude of the aircraft. See 06-60-00 for data about the applicable scenario.

4. Job Set-up Information

   A. Referenced Information

REFERENCE	DESIGNATION
DESC 06-00-00-002-A01	DESC 06-00-00-002-A01-Leveling/Lifting Obstructions
06-60-00	06-60-00-LEVELING AND LIFTING SCENARIOS
04-30-00	04-30-00-TETHERING THE AIRCRAFT
03-00-00	03-00-00-WEIGHT AND CG MANAGEMENT
06-10-00	06-10-00-LOAD DETERMINATION
04-50-00	04-50-00-SOIL STABILITY
03-20-01	03-20-01-FUEL LOAD AND CG CONTROL
06-30-00	06-30-00-USE OF JACKS
07-60-00	07-60-00-MOVING DAMAGED AIRCRAFT
AMM 07-11-00-581-801	

Referenced Information

TABLE 1

5. Procedure

WARNING : OBEY THESE PRECAUTIONS WHEN YOU DO LEVELING/LIFTING OF THE AIRCRAFT. MAKE SURE THAT THE LIFTING EQUIPMENT IS APPLICABLE FOR THE SPECIFIC CONDITIONS. MAKE SURE THAT THE PERSONS WHO OPERATE THE LIFTING EQUIPMENT ARE CORRECTLY TRAINED AND HAVE A GOOD KNOWLEDGE OF THE SYSTEM. MAKE SURE THAT THE NECESSARY SAFETY AREA IS KNOWN AND THAT PERSONS DO NOT GO IN THIS AREA DURING THE LEVELING/LIFTING OPERATIONS. LEVELING/LIFTING OF THE AIRCRAFT CAN BE DANGEROUS IF YOU DO NOT OBEY THESE PRECAUTIONS.

CAUTION : MAKE SURE THAT THE LOADS ON THE AIRFRAME ARE LESS THAN THE ALLOWABLE LOADS WHEN YOU USE SUPPORTS. THE SUPPORTS APPLY LOADS THAT DO NOT OCCUR IN NORMAL OPERATION.

CAUTION : THE STIFFNESS AND LATERAL STABILITY OF PNEUMATIC LIFTING BAG CAN CHANGE DURING THE INFLATION PROCESS OF THE PNEUMATIC LIFTING BAG STACK. IT IS THE RESPONSIBILITY OF THE PNEUMATIC LIFTING BAG MANUFACTURER TO PROVIDE ADEQUATE DATA ON THE USE OF ITS LIFTING BAGS.
IT IS THE RESPONSIBILITY OF THE RECOVERY MANAGER TO MAKE SURE THAT USE OF THE PNEUMATIC LIFTING BAG WILL NOT LEAD TO AIRCRAFT MOVEMENT DUE TO THE INFLUENCE OF WIND AND/OR CHANGE OF CG POSITION DURING AIRCRAFT LIFTING/LEVELING.

CAUTION : WHEN YOU LEVEL/LIFT THE AIRCRAFT, YOU MUST CONTINUOUSLY MONITOR AND RECORD THE LOADS AND MAKE SURE THAT THE LOADS YOU APPLY ARE NOT MORE THAN THE MAXIMUM ALLOWABLE LOADS. IF THE LOADS ARE MORE THAN THE ALLOWABLE LOADS, THIS CAN CAUSE DAMAGE TO THE AIRCRAFT STRUCTURE.

CAUTION : IF THE LOADS APPLIED DURING THE RECOVERY PROCEDURE ARE MORE THAN THE MAXIMUM ALLOWABLE LOADS, YOU MUST CONTACT AIRBUS FOR SPECIFIC INSPECTIONS.

CAUTION : DO NOT PUT THE LIFTING BAGS UNDER PROTRUDING STRUCTURES (FLAP TRACKS,PYLON FAIRINGS, ETC.), SHARP EDGES OR ANGLES BECAUSE THEY CAN CAUSE DAMAGE TO THE LIFTING BAGS.

CAUTION : YOU MUST CORRECTLY TETHER THE AIRCRAFT BEFORE YOU LEVEL OR LIFT IT.

CAUTION : MAKE SURE THAT THE PNEUMATIC LIFTING BAGS DO NOT APPLY LOADS ON THE BELLY FAIRING STRUCTURE. IF NECESSARY, REMOVE THE BELLY FAIRINGS AND THE BELLY FAIRING STRUCTURE TO GET ACCESS TO THE ALLOWABLE BEARING AREA.

NOTE : The information or principle contained in this chapter are given as a guide to assist an aircraft recovery.

NOTE : It is the responsibility of the recovery manager to make the decision about the applicable method and related equipment/personnel for the leveling/lifting of the aircraft.

Subtask 06-40-00-581-001-A01

A. General fuselage lifting

NOTE : Before you start to level or lift the aircraft with pneumatic lifting bags, you must make sure that the personnel know the instructions and conditions below and that they obey these instructions and conditions.

(1) Do not lift the aircraft with pneumatic lifting bags in gusty wind conditions.

(2) Do not lift the aircraft with pneumatic lifting bags during steady wind conditions.

(3) Find the maximum allowable wind speed related to your aircraft configuration. See TBD.

(4) Correctly tether the aircraft before leveling or lifting with pneumatic lifting bags. This is to prevent aircraft movement that you cannot control during the leveling or lifting operation. See 04-30-00.

(5) Read the manufacturer instructions applicable to the pneumatic lifting bags that you use.

(6) Only the personnel that knows the operation of pneumatic lifting bags and aircraft jacking procedures should be in charge of the pneumatic lifting bags operation.

(7) Confirm the aircraft NRW and CG. See 03-00-00.

(8) Calculate the anticipated vertical load on each lifting bag position to be used to make sure the necessary load is not more than the maximum allowable load on the skin. See 06-10-00.
If the necessary load on the bearing area of the pneumatic lifting bag is more than the allowable load for that leveling/lifting point, reduce the aircraft weight until the lifting load is less than the allowable load or make a selection of another leveling or lifting procedure.

(9) Calculate the total lift of each pneumatic lifting bag used. Make sure each available lifting bag can support the necessary loads (vertical and side), arc movement and travel range, and can fit in the limits of the fuselage or wing contact zone.
To reduce the necessary lifting load, we recommend that you reduce the aircraft weight with the removal of cargo or payload from the aircraft before a leveling/lifting operation, see 06-10-00.

(10) Calculate the expected arc movement during the leveling/lifting operation, at the center of the bearing area of each pneumatic lifting bag . Also calculate the side load if necessary, see 06-10-00.

(11) Before you use pneumatic lifting bags, do an inspection of the structure to make sure there is no damage in the leveling/lifting area. If there is damage, the pneumatic lifting bags must be installed at least one non-damaged rib/fuselage frame away from the damaged area. Remove all sharp edges from the contact area. Use a heavy tarpaulin between the aircraft skin and the pneumatic lifting bag to prevent damage to the top of the bag.

(12) Put the pneumatic lifting bags in the allowable bearing areas, and make sure no sharp edges or peaks (damaged skin , protruding structure, antennas ...) are in the area where the bags will be installed.

(13) Remove some unwanted items from the aircraft before you install the pneumatic lifting bags, see DESC 06-00-00-002-A01.

(14) If necessary, excavate a sufficiently large area to make a stable base for the pneumatic lifting bags. Make sure that the ground/soil can support the load at each lifting bag footprint, and will stay stable during the leveling/lifting operation, see 04-50-00. Make a satisfactory base for the height of the compressed pneumatic lifting bags. Make sure that the base is sufficiently large to change the position of the pneumatic lifting bags during the leveling/lifting operation if necessary. If the inflated pneumatic lifting is not sufficiently high to lift the aircraft, it will be necessary to make a sufficiently high platform. It is possible to make this platform with timber or to use an inflatable type platform.

(15) Adjust the pneumatic lifting bag base to let the bags follow the shape of the lower fuselage/wing surface. It can be necessary to use jacks to move the wooden base/pneumatic lifting bag supports when the aircraft moves.

(16) Put wheel chocks in front and behind the wheels of each landing gear that is extended and in contact with the ground.

(17) Install landing gear downlock pins in all landing gears that are extended.

(18) Each operator at the pneumatic-lifting bag control console must have a good visibility of the person in charge of the leveling/lifting operation. Coordination between all the console operators is very important. Two-way voice headsets are very good for this type of operation.

(19) No personnel must be in or below the aircraft during the leveling/lifting process.

(20) Movement of fuel in the wing tanks because of aircraft leveling/lifting can cause a change in the aircraft CG position. It is thus recommended that all fuel is removed from the aircraft before leveling/lifting, see 03-20-01. This will also reduce the necessary lifting loads.

(21) Monitor the CG during all the aircraft leveling/lifting process and be prepared to control with ballast if necessary, see 06-10-00.

(22) Monitor and record the applied loads (pressure in the pneumatic lifting bags) at all times during the leveling/lifting process.

(23) You must carefully monitor the arc movement of the pneumatic lifting bags. Use a plumb bob to monitor pneumatic lifting bag movement at each position.

(24) Install aft tipping protection if necessary.

(25) Before you inflate the pneumatic lifting bags, make sure that you know all the warnings and safety precautions. Make sure that all equipment (such as shoring material or jacks) is prepared and available to use.

(26) Obey the manufacturer's instructions: inflate the lifting bags slowly and adjust the tethers when the aircraft starts to move.

(27) When the fuselage and wing are level, and if the aircraft needs to be lifted, it is recommended to use the 3 jacking points to lift the aircraft to the necessary height, see AMM 07-11-00-581-801. It is mandatory that the aircraft is in a level attitude (wing and fuselage) before you lift it.

(28) When the aircraft is at the necessary height

  (a) Build shoring to support the fuselage and/or wings, or install jacks (see 06-30-00) as a safety measure during any work on the landing gears.

  (b) Extend the landing gear(s) and install downlock pin(s),

  (c) Or repair or replace the landing gear(s),

  (d) Or, if it is not possible to make the landing gear(s) serviceable, place the forward fuselage and/or the wing(s) on a mobile device, see 07-60-00.

(29) After the recovery process, do an inspection of the skin in the contact areas of the pneumatic bag for scratches, nicks and gouges caused by sand or stones trapped between the contact surfaces.

06-50 USE OF CRANES

06-50-00 USE OF CRANES

****ON A/C A330-200 A330-300**

DESC 06-50-00-001-A01

Fuselage Crane Lifting

1. General

CAUTION : MAKE SURE THAT THE LOADS ON THE AIRFRAME ARE LESS THAN THE ALLOWABLE LOADS WHEN YOU USE SUPPORTS. THE SUPPORTS APPLY LOADS THAT DO NOT OCCUR IN NORMAL OPERATION.

CAUTION : DO NOT INSTALL THE SLINGS UNDER PROTRUDING STRUCTURES (FLAP TRACKS, PYLON FAIRINGS, DRAINS, ANTENNAS, ETC.), SHARP EDGES OR ANGLES BECAUSE THEY CAN CAUSE DAMAGE TO THE SLINGS.

CAUTION : USE ONLY RECOVERY SLINGS AND SPREADER BEAMS SPECIFIED BY AIRBUS. NON-APPROVED LIFTING DEVICES CAN CAUSE SECONDARY DAMAGE TO THE AIRCRAFT.

This section describes the use of slings and cranes for leveling and lifting: sling contact areas, crane lifting points and allowable loads.

2. Location

Slings can be installed under the fuselage, between FR26 and FR37 and between FR56 and FR59. See FIGURE 06-50-00-991-014-AFIGURE 06-50-00-991-014-C.
Before you install the slings, you must check that there is no structural damage within the bearing area. If you find damage, contact Airbus.
Structurally damaged frames cannot support lifting loads.

NOTE : Some items (drains, antennas, etc.) can prevent sling installation or cause damage to them. Thus, you must remove these items before you install the slings. See DESC 06-00-00-002-A01 for the list of leveling/lifting obstructions.

****ON A/C A330-200**

3. Allowable Loads

The maximum total lifting load at the forward fuselage is 50 000 daN (112 404 lbf).
The maximum total lifting load at the aft fuselage is 20 000 daN (44 962 lbf).
It is not allowed to apply the maximum allowable load per frame at more than 10 frames at the forward fuselage and 4 frames at the aft fuselage.
In case of using more than 4 slings or if the total lifting load is more than 20 000 daN (44 962 lbf), it is mandatory to install a sling at FR37 for the forward fuselage and FR56 for the aft fuselage.
See FIGURE 06-50-00-991-014-A for the formula to calculate the lifting force.

The maximum lifting force is related to the number of slings used and the length of the spreader bar. See FIGURE 06-50-00-991-016-A for the lifting scenarios.

A. Multiple sling with 2 cranes:
   - FR26 to FR37: maximum lifting force of 5 000 daN (11 240 lbf) per sling and 50 000 daN (112 404 lbf) for the total load on forward fuselage.
   - FR56 to FR59: maximum lifting force of 5 000 daN (11 240 lbf) per sling and 20 000 daN (44 962 lbf) for the total load on aft fuselage.

B. Multiple sling and spreader bar with 1 crane:
   - FR26 to FR37: maximum lifting force of 5 000 daN (11 240 lbf) per sling and 50 000 daN (112 404 lbf) for the total load on forward fuselage.
   - FR56 to FR59: maximum lifting force of 5 000 daN (11 240 lbf) per sling and 20 000 daN (44 962 lbf) for the total load on aft fuselage.

**ON A/C A330-300

4. Allowable Loads

The maximum total lifting load at the forward fuselage is 50 000 daN (112 404 lbf).
The maximum total lifting load at the aft fuselage is 40 000 daN (89 924 lbf).
It is not allowed to apply the maximum allowable load per frame at more than 10 frames at the forward fuselage and 8 frames at the aft fuselage.
In case of using more than 4 slings or if the total lifting load is more than 20 000 daN (44 962 lbf), it is mandatory to install a sling at FR37 for the forward fuselage and FR56 for the aft fuselage.
See FIGURE 06-50-00-991-014-C for the formula to calculate the lifting force.
The maximum lifting force is related to the number of slings used and the length of the spreader bar. See FIGURE 06-50-00-991-016-C for the lifting scenarios.

A. Multiple sling with 2 cranes:
   - FR26 to FR37: maximum lifting force of 5 000 daN (11 240 lbf) per sling and 50 000 daN (112 404 lbf) for the total load on forward fuselage.
   - FR56 to FR59: maximum lifting force of 5 000 daN (11 240 lbf) per sling and 40 000 daN (89 924 lbf) for the total load on aft fuselage.

B. Multiple sling and spreader bar with 1 crane:
   - FR26 to FR37: maximum lifting force of 5 000 daN (11 240 lbf) per sling and 50 000 daN (112 404 lbf) for the total load on forward fuselage.
   - FR56 to FR59: maximum lifting force of 5 000 daN (11 240 lbf) per sling and 40 000 daN (89 924 lbf) for the total load on aft fuselage.

**ON A/C A330-200 A330-300

5. Sling Installation

For leveling/lifting of airframes with fuselage recovery slings, specific tooling is necessary:
- Slings
- Multiple sling adaptors
- Spreader bar.

A. Slings

The slings can consist of one or more straps.
The slings are in direct contact with the aircraft fuselage skin. Therefore, they must be made from soft nylon in order to prevent scratches and gouges.
The minimum width of the straps must be 200 mm (8 in), there is no limit for the maximum width.
The slings must be installed at the exact location of the frame, and centered on the frame rivet line that you can identify on the aircraft fuselage. See FIGURE 06-50-00-991-014-AFIGURE 06-50-00-991-014-C.
For scenarios 1B and 2B (see FIGURE 06-50-00-991-016-AFIGURE 06-50-00-991-016-C) the minimum necessary length of slings is constant at 16 500 mm (650 in).
For other scenarios the minimum required sling length will be in relation to the available spreader bar length.
It is recommended not to use slings with straps longer than necessary.
The two ends of the straps must have suitable loops for attachment to the crane hook or the multiple sling adaptor.
The straps must be in good condition without broken fibers, cuts, nicks or gouges.
See FIGURE 06-50-00-991-015-AFIGURE 06-50-00-991-015-B for the necessary steps for selection and installation of slings on the fuselage.

B. Multiple Sling Adaptor

The multiple sling adaptor must be adapted to scenarios 1A, 2A, 1B and 2B if more than one sling is required for lifting (see FIGURE 06-50-00-991-019-AFIGURE 06-50-00-991-019-C).
The multiple sling adaptor makes a link between the fuselage slings. The function of the adaptor is to make sure that the loads are equally applied to each sling and to keep the same distance between the slings as the frame pitch (533 mm / 21 in). It is possible to use the multiple sling adaptor with a different but symmetrical number of slings, from 2 slings to 10 slings at the forward and aft fuselage, (depending on Aircraft Model).
The total lifting force applied to each sling must not be more than 5 000 daN (11 240 lbf), or equivalent to 2 500 daN (5 620 lbf) at each side of the slings. The maximum total allowable lifting loads at the forward and the aft fuselage, must not be exceeded when you use multiple slings, see TBD.
To obtain the constant load distribution described above, the multiple sling adaptor must obey specific design requirements (See FIGURE 06-50-00-991-019-AFIGURE 06-50-00-991-019-C).
Multiple sling adaptor design data:

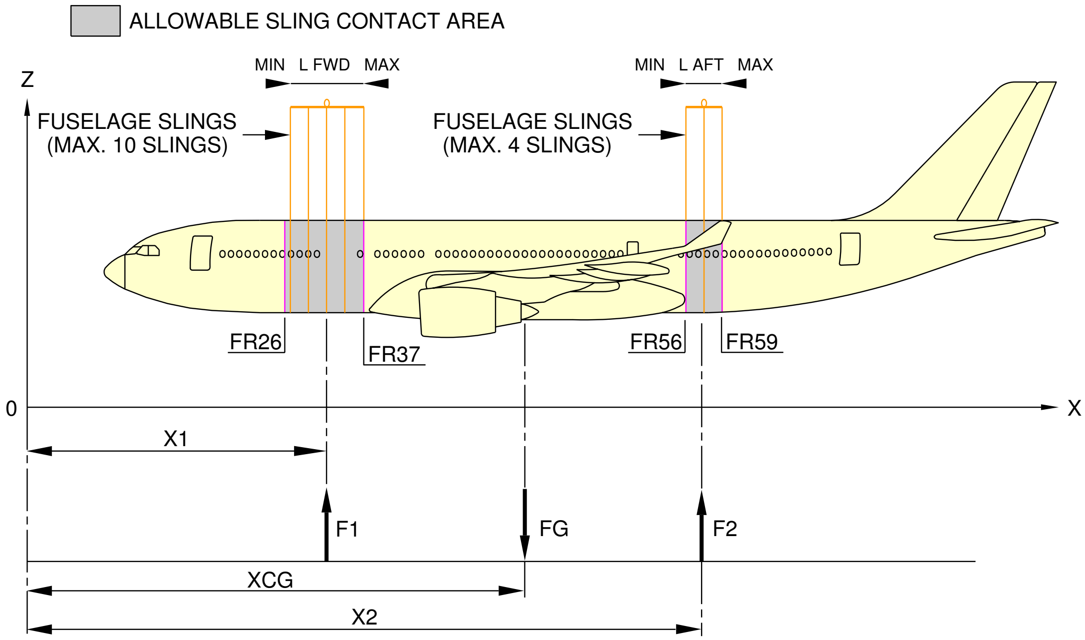
- Static values of the multiple sling adaptor: minimum necessary bending stiffness at center line = 6 750 cm^3 (1 620 in^3),
- Wire tension in pulley assembly: a maximum vertical force of 5 000 daN (11 240 lbf) can be applied to each frame station, equivalent to 2 500 daN (5 620 lbf) maximum at each end of the fuselage slings. This load is divided by two due to the pulley design. Therefore, the wire tension limit load in the pulley assembly is 1 250 daN (2 810 lbf). Ground service equipment for hoisting must have a minimum safety factor of 5.0. Therefore, the wire and pulley assembly must be sufficiently strong to support a total load of 6 250 daN (14 051 lbf).

C. Spreader Bar

When only one crane is available, you can use a transverse spreader bar to make a link between each side of the aircraft. The allowable load at each frame station depends on the fuselage sling angle. The maximum load of 5 000 daN (11 240 lbf) per frame station is only permitted with a sling angle of 180 degrees. To obtain this angle, it is necessary either to use 2 cranes or, alternatively, to use a transversal spreader bar with a length equal to the fuselage diameter (5 640 mm / 222 in). For any other lifting angle than 180°, contact Airbus.

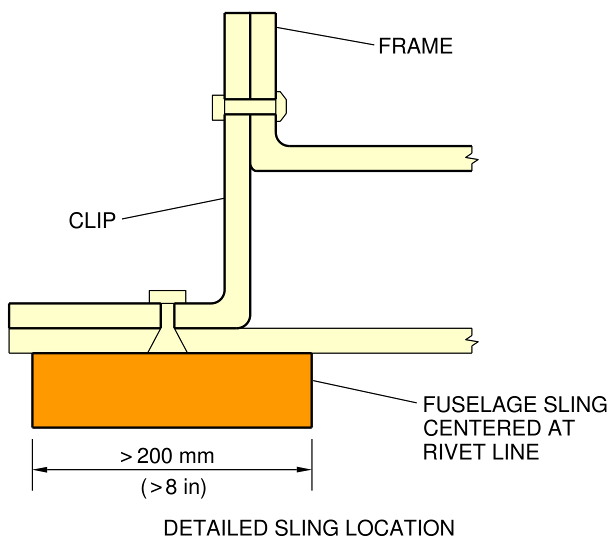
NOTE : Multiple-sling systems supplied by vendors usually come with the transverse spreader bar.

**ON A/C A330-200



$$F2 = \frac{XCG - X1}{X2 - X1} \times FG < 20000 \text{ daN}$$

$$F1 = FG - F2 < 50000 \text{ daN}$$



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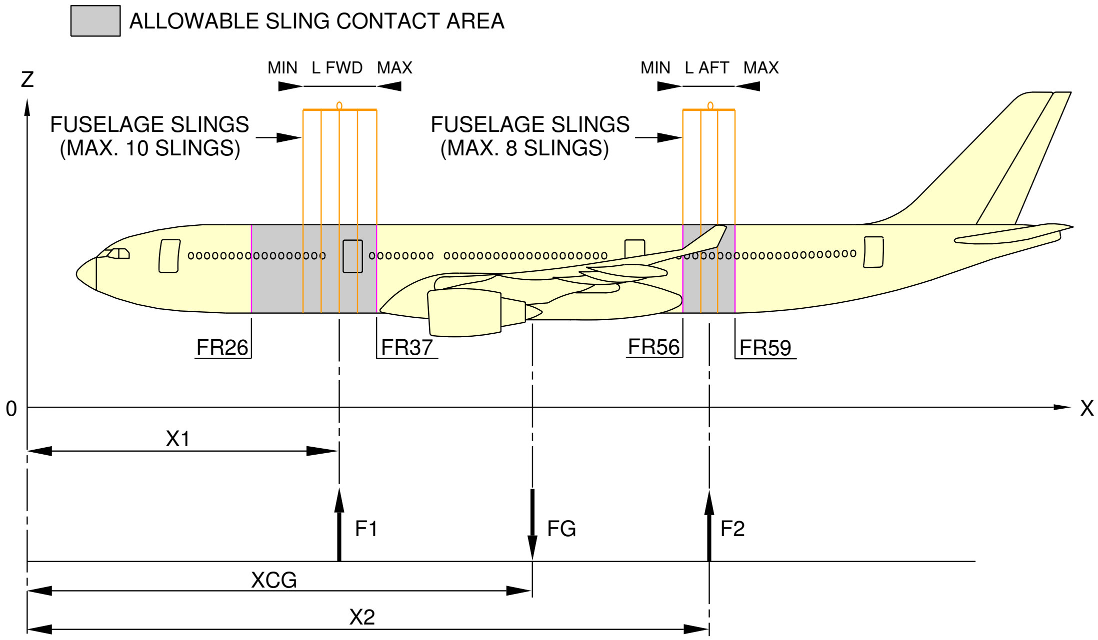
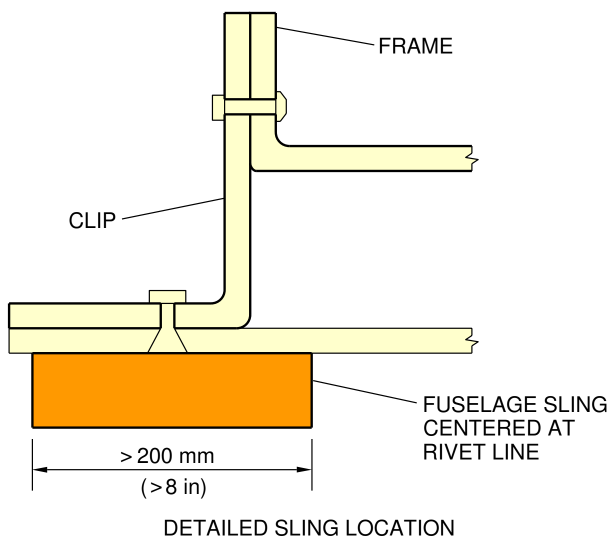
Fuselage Sling Lifting
Allowable Contact Area
FIGURE-06-50-00-991-014-A01

**ON A/C A330-300



$$F2 = \frac{XCG - X1}{X2 - X1} \times FG < 40000 \text{ daN}$$

$$F1 = FG - F2 < 50000 \text{ daN}$$



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Fuselage Sling Lifting
Allowable Contact Area
FIGURE-06-50-00-991-014-C01

**ON A/C A330-200

CALCULATE AIRCRAFT CG AND REQUIRED LIFTING FORCE (SEE ARM 03):

MAXIMUM LIFTING FORCE:
– FWD FUSELAGE: < 50000 daN
– AFT FUSELAGE: < 20000 daN

DETERMINE NUMBER OF REQUIRED SLINGS:

SLING ANGLE = 180°
DIVIDE REQUIRED LIFTING FORCE BY:
– FWD/AFT FUSELAGE: < 5000 daN

DETERMINE REQUIRED LIFTING CLEARANCE OF HANGAR AND/OR CRANE:
(SEE TASK 06–50–00–581–801)

DETERMINE AVAILABLE TOOLS:

– AVAILABLE SLING LENGTH
– AVAILABLE SPREADER BAR LENGTH

ALL TOOLS MUST MEET AIRBUS SPECIFICATIONS

CHOOSE LIFTING SCENARIO:

180° LIFTING ANGLE TO BE PREFERRED.
FOR ALL OTHER LIFTING ANGLES:
CONTACT AIRBUS

LOCATE SLINGS IN ALLOWABLE AREAS:

– OBEY SAFETY PRECAUTIONS BEFORE LIFTING

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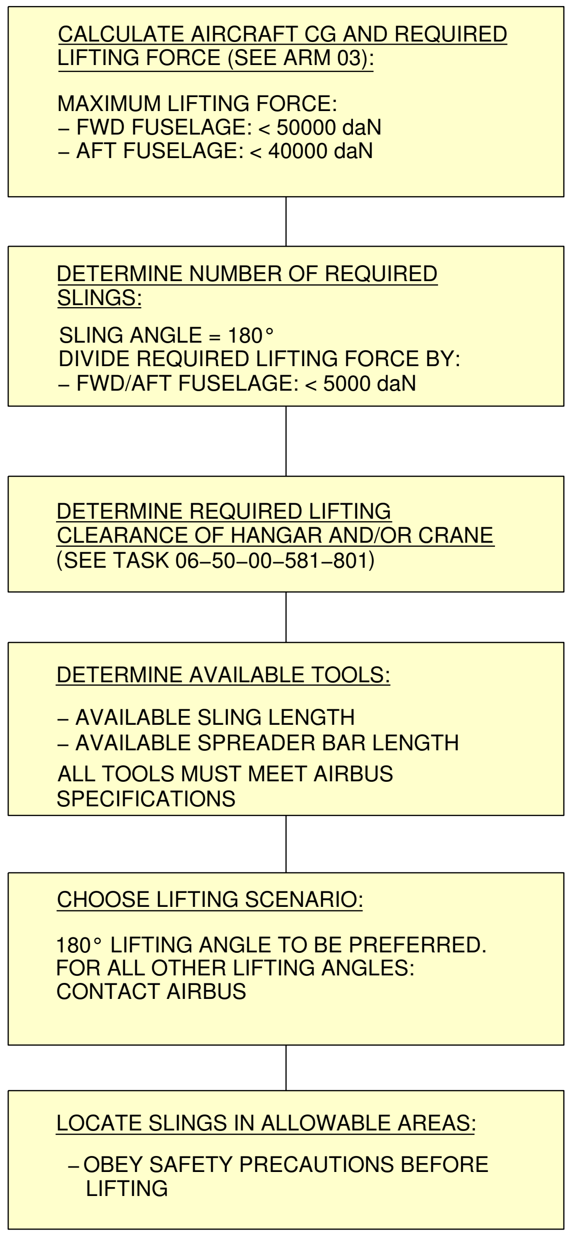
Fuselage Sling Installation
Flowchart
FIGURE-06-50-00-991-015-A01

**ON A/C A330-300



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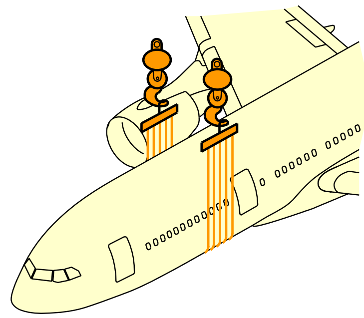
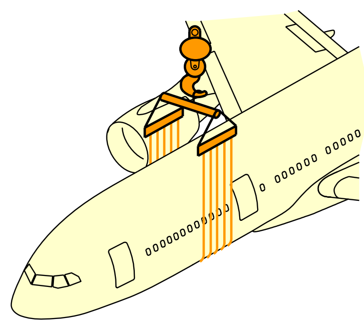
Fuselage Sling Installation
Flowchart
FIGURE-06-50-00-991-015-B01

**ON A/C A330-200

SCENARIO 1A:
2 CRANES WITH MULTIPLE SLING ADAPTOR.
MAX LIFTING FORCE:
5000 daN x NUMBER OF SLINGS.
(MAX 10 SLINGS).



SCENARIO 2A:
1 CRANE WITH MULTIPLE SLING ADAPTOR AND
SPREADER BAR.
MAX LIFTING FORCE:
5000 daN x NUMBER OF SLINGS.
(MAX 10 SLINGS).



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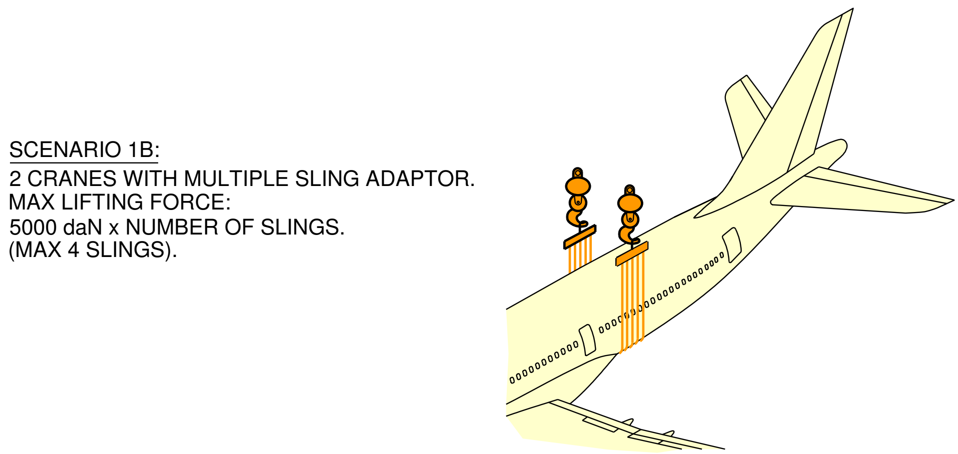
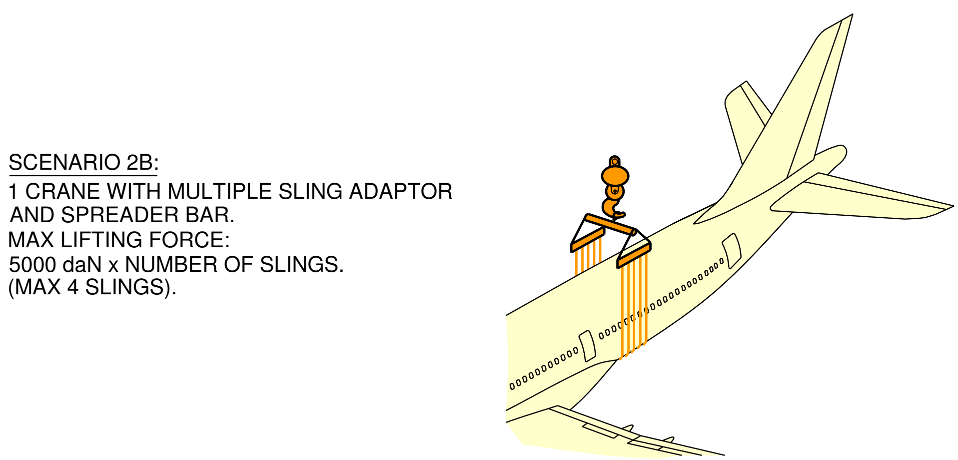
Lifting With Sling Scenarios
FWD Fuselage Area (Sheet 1 of 2)
FIGURE-06-50-00-991-016-A01

**ON A/C A330-200





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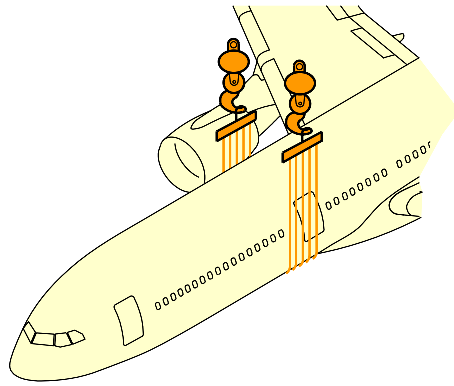
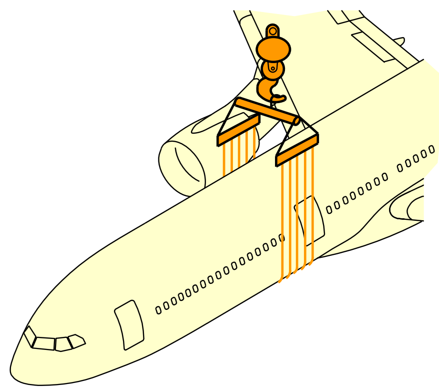
Lifting With Sling Scenarios
Aft Fuselage Area (Sheet 2 of 2)
FIGURE-06-50-00-991-016-A01

**ON A/C A330-300

SCENARIO 1A:
2 CRANES WITH MULTIPLE SLING ADAPTOR.
MAX LIFTING FORCE:
5000 daN x NUMBER OF SLINGS.
(MAX 10 SLINGS).



SCENARIO 2A:
1 CRANE WITH MULTIPLE SLING ADAPTOR
AND SPREADER BAR.
MAX LIFTING FORCE:
5000 daN x NUMBER OF SLINGS.
(MAX 10 SLINGS).



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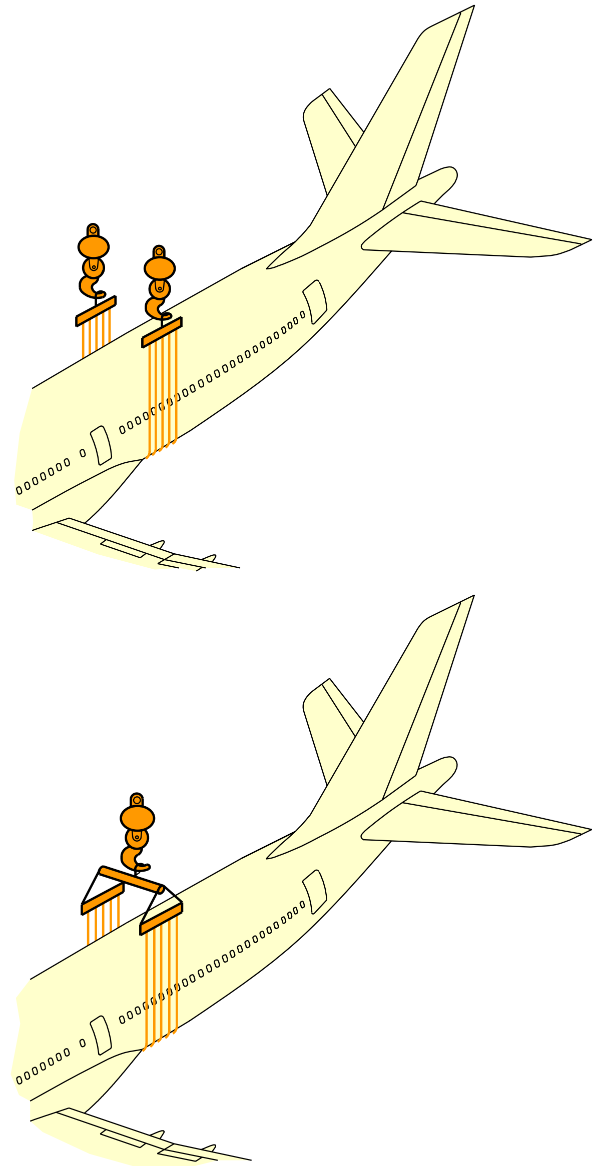
Lifting With Sling Scenarios
FWD Fuselage Area (Sheet 1 of 2)
FIGURE-06-50-00-991-016-C01

**ON A/C A330-300

SCENARIO 1B:
2 CRANES WITH MULTIPLE SLING ADAPTOR.
MAX LIFTING FORCE:
5000 daN x NUMBER OF SLINGS.
(MAX 8 SLINGS).

SCENARIO 2B:
1 CRANE WITH MULTIPLE SLING ADAPTOR
AND SPREADER BAR.
MAX LIFTING FORCE:
5000 daN x NUMBER OF SLINGS.
(MAX 8 SLINGS).



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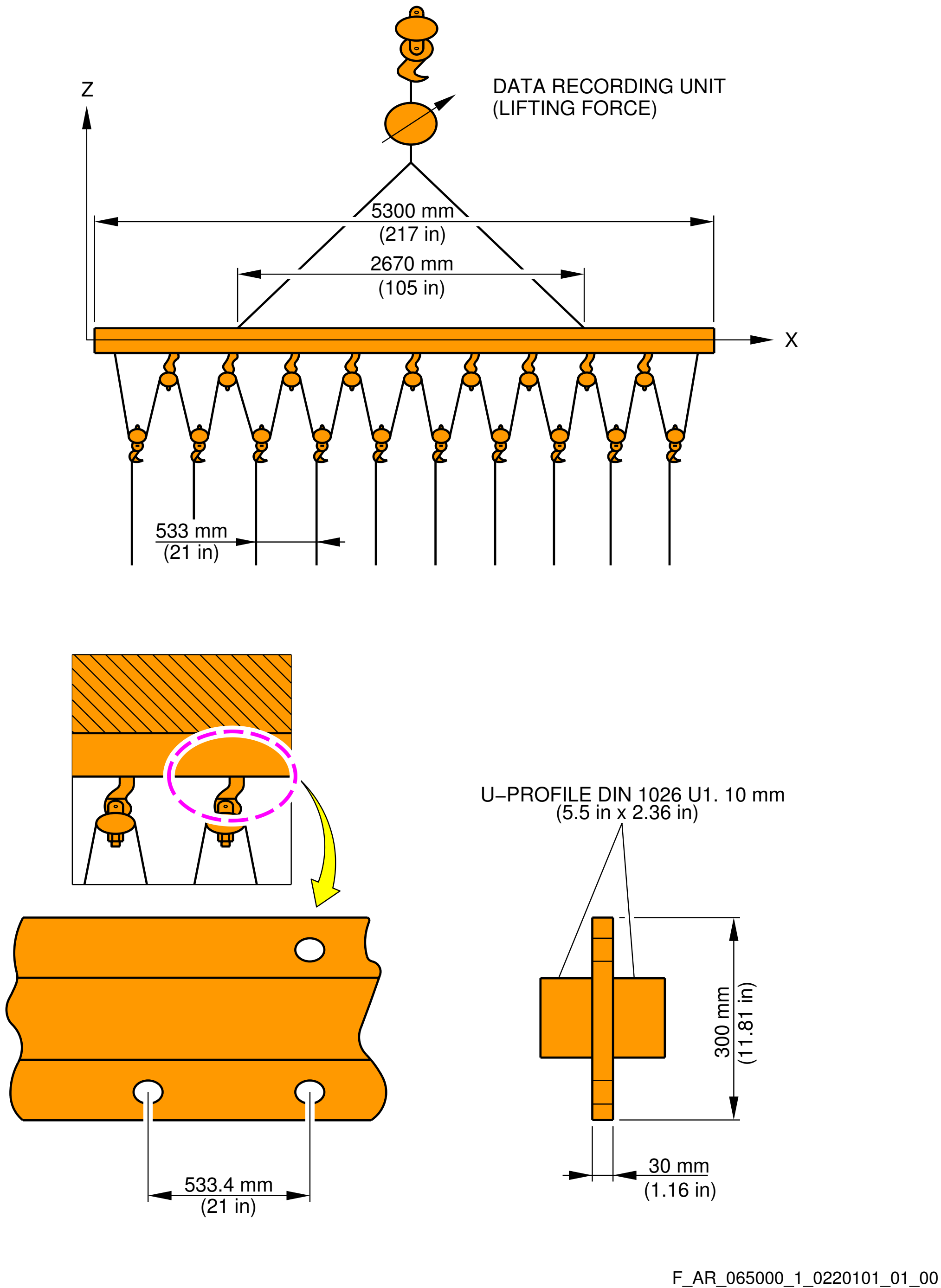
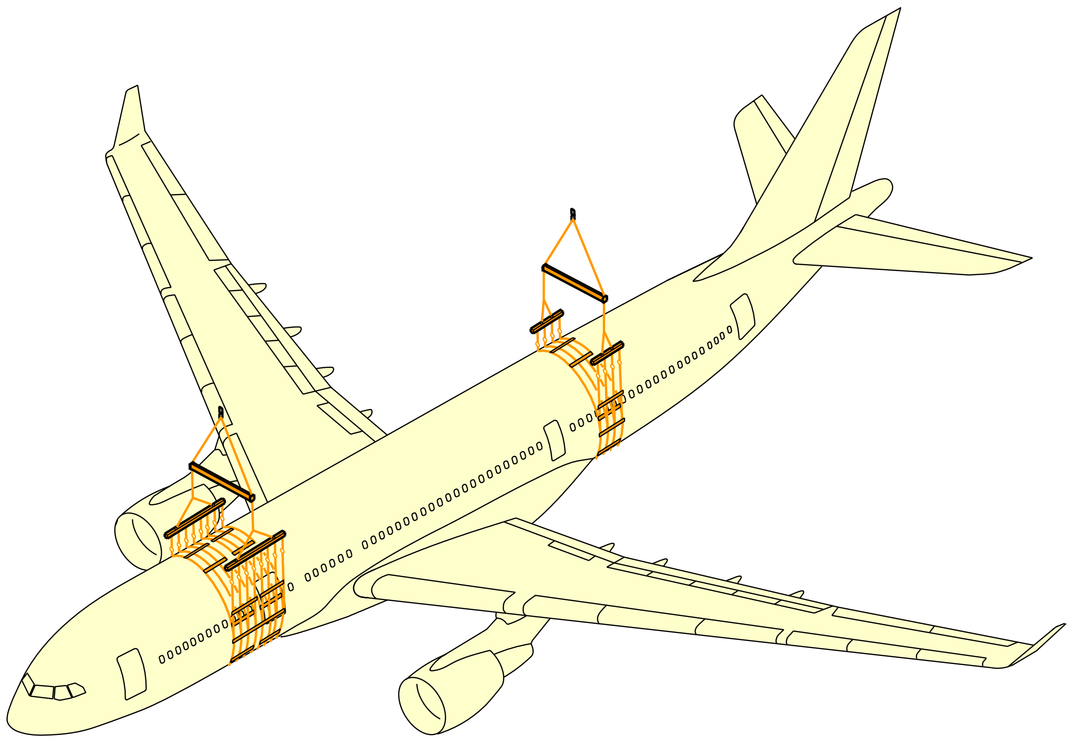
Lifting With Sling Scenarios
Aft Fuselage Area (Sheet 2 of 2)
FIGURE-06-50-00-991-016-C01

**ON A/C A330-200 A330-300



Multiple Sling Adaptor
Design
FIGURE-06-50-00-991-022-A01

**ON A/C A330-200



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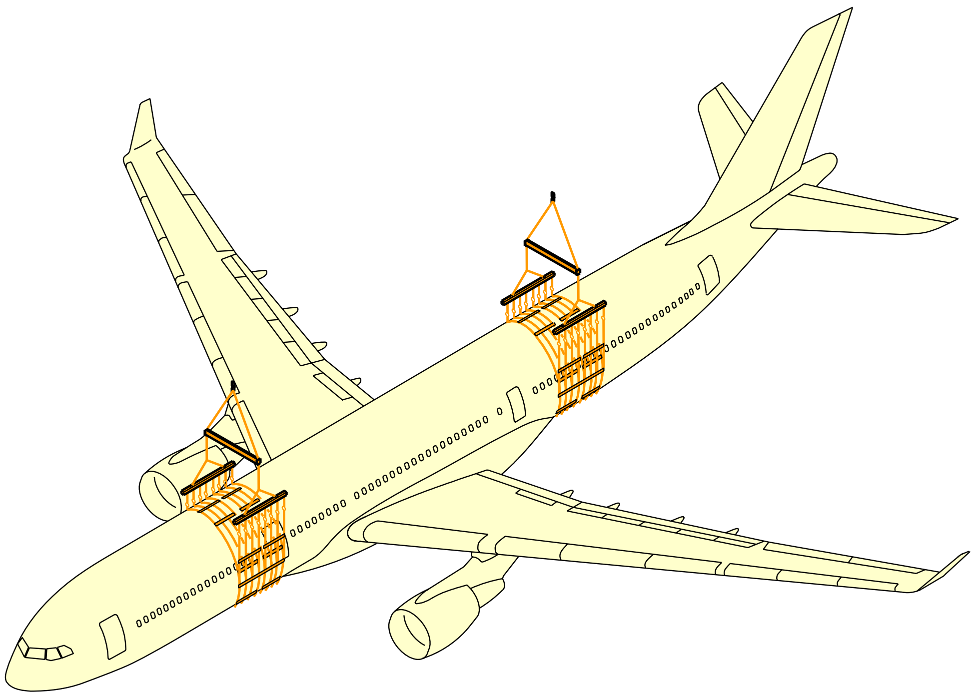
Multiple Sling Adaptor
Installation
FIGURE-06-50-00-991-019-A01

**ON A/C A330-300



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Multiple Sling Adaptor
Installation
FIGURE-06-50-00-991-019-C01

****ON A/C A330-200 A330-300**

TASK 06-50-00-581-801-A01

General Preparation and Instructions for Leveling and Lifting the Aircraft with Cranes

1. General
This section gives the data related to the use of crane for leveling and lifting.

2. Inspections
Not Applicable.

3. Job Setup References
Crane/sling travel range is related to the attitude of the aircraft. See 06-60-00 for information related to the applicable scenario.

4. Job Set-up Information

A. Referenced Information

REFERENCE	DESIGNATION
TASK 03-50-01-558-803-A01	TASK 03-50-01-558-803-A01-Ballast Added Effect
TASK 02-30-01-481-802-A02	TASK 02-30-01-481-802-A02-Installation of the Safety Devices on Landing Gears
DESC 06-00-00-002-A01	DESC 06-00-00-002-A01-Leveling/Lifting Obstructions
DESC 06-50-00-001-A01	DESC 06-50-00-001-A01-Fuselage Crane Lifting
06-60-00	06-60-00-LEVELING AND LIFTING SCENARIOS
04-30-00	04-30-00-TETHERING THE AIRCRAFT
03-50-01	03-50-01-MANAGING AIRCRAFT WEIGHT AND CG
05-50-00	05-50-00-CARGO COMPARTMENTS
05-60-00	05-60-00-REMOVAL OF LARGE COMPONENTS
06-10-00	06-10-00-LOAD DETERMINATION
05-10-00	05-10-00-DEFUELING
06-30-00	06-30-00-USE OF JACKS
06-40-00	06-40-00-USE OF PNEUMATIC LIFTING BAGS
07-20-00	07-20-00-PREPARING A ROADWAY
07-40-00	07-40-00-TOWING AND DEBOGGING

Referenced Information

TABLE 1

5. Procedure

WARNING : OBEY THESE PRECAUTIONS WHEN YOU DO LEVELING/LIFTING OF THE AIRCRAFT. MAKE SURE THAT THE LIFTING EQUIPMENT IS APPLICABLE FOR THE SPECIFIC CONDITIONS. MAKE SURE THAT THE PERSONS WHO OPERATE THE LIFTING EQUIPMENT ARE CORRECTLY TRAINED AND HAVE A GOOD KNOWLEDGE OF THE SYSTEM. MAKE SURE THAT THE NECESSARY SAFETY AREA IS KNOWN AND THAT PERSONS DO NOT GO IN THIS AREA DURING THE LEVELING/LIFTING OPERATIONS. LEVELING/LIFTING OF THE AIRCRAFT CAN BE DANGEROUS IF YOU DO NOT OBEY THESE PRECAUTIONS.

CAUTION : MAKE SURE THAT THE LOADS ON THE AIRFRAME ARE LESS THAN THE ALLOWABLE LOADS WHEN YOU USE SUPPORTS. THE SUPPORTS APPLY LOADS THAT DO NOT OCCUR IN NORMAL OPERATION.

CAUTION : WHEN YOU LEVEL/LIFT THE AIRCRAFT, YOU MUST CONTINUOUSLY MONITOR AND RECORD THE LOADS AND MAKE SURE THAT THE LOADS YOU APPLY ARE NOT MORE THAN THE MAXIMUM ALLOWABLE LOADS. IF THE LOADS ARE MORE THAN THE ALLOWABLE LOADS, THIS CAN CAUSE DAMAGE TO THE AIRCRAFT STRUCTURE.

CAUTION : IF THE LOADS APPLIED DURING THE RECOVERY PROCEDURE ARE MORE THAN THE MAXIMUM ALLOWABLE LOADS, YOU MUST CONTACT AIRBUS FOR SPECIFIC INSPECTIONS.

CAUTION : USE ONLY RECOVERY SLINGS AND SPREADER BEAMS SPECIFIED BY AIRBUS. NON-APPROVED LIFTING DEVICES CAN CAUSE SECONDARY DAMAGE TO THE AIRCRAFT.

CAUTION : MAKE SURE THAT THE CRANE YOU USE CAN LIFT THE ESTIMATED LOAD PLUS THE WEIGHT OF THE LIFTING EQUIPMENT BEFORE YOU START TO LIFT THE AIRCRAFT.

CAUTION : YOU MUST CORRECTLY TETHER THE AIRCRAFT BEFORE YOU LEVEL OR LIFT IT.

NOTE : The information or principle contained in this chapter are given as a guide to assist an aircraft recovery.

NOTE : It is the responsability of the recovery manager to make the decision about the applicable method and related equipment/personnel for the leveling/lifting of the aircraft.

Subtask 06-50-00-581-001-A01

A. General

NOTE : Before you start a leveling or lifting procedure with slings/cranes, make sure that the following instructions are obeyed.

(1) Do not level or lift the aircraft with cranes during gusty wind conditions.

(2) The common maximum permissible wind speed for mobile cranes is 50 km/h (27 kt) with steady wind. Airbus recommends not to lift the aircraft if the wind speed is higher. It is also recommended not to use cranes during thunderstorms to prevent lightning strike.

(3) Before you start the leveling or lifting operation with cranes, you must correctly tether the aircraft. This is to prevent uncontrolled movement of the aircraft during this operation specially in case of high wind condition (See 04-30-00).

(4) Only personnel familiar with the operating procedures of the slings, spreader beams and cranes should be in charge of the lifting operation.

(5) Calculate the NRW and CG position (See 03-50-01).

(6) Calculate the anticipated vertical load on the fuselage and make sure that the necessary load is not more than the maximum allowable load.
If the necessary load is more than the allowable load, you must either decrease the aircraft weight until the lifting load is less than the allowable load or use another leveling or lifting procedure.

(7) Calculate the total lifting capacity of the slings and cranes that you use are able to hold.
Make sure that each available sling or crane can hold the necessary load, and can fit within the boundaries of the fuselage contact zone.
The crane lifting strength must be higher than the lifting loads and the jib length must be sufficient to allow aircraft movement (lateral and vertical).
To decrease the necessary lifting load, it is recommended to decrease the aircraft weight by removal of cargo or payload from the aircraft before start of the leveling or the lifting operation (See 05-50-00 and/or 05-60-00).

(8) Use the minimum necessary sling lengths and spreader bar width to find the minimum assembly height.
The height of the crane or the hangar roof can be a limit to the height of the assembly.

(9) Calculate the possible arc movement during the leveling operation, at each lifting point. Also calculate the side load if necessary (see 06-10-00).

(10) The frame station and lifting points that will be used for lifting must not be damaged. In case of damage, contact Airbus.

(11) Make sure that there are no sharp edges or peaks (skin damages, protruding structure, antenna ...) in the zones where the fuselage recovery slings will be installed.
See DESC 06-00-00-002-A01 for the list of leveling/lifting obstructions.

(12) If necessary, put wheel chocks in front of and behind the wheels of the main landing gear that is extended and in contact with the ground.

(13) Install the landing gear downlock pins in all landing gears that are extended.

(14) All the persons who work on the leveling/lifting operation should be connected with mobile communication devices. Two-way voice activated headsets are ideal for this type of operation.

(15) No personnel must be in or below the aircraft during the leveling process. The personnel who is not directly involved in the lifting operation must be at least 20 m (65 ft) far from the aircraft and cranes.

(16) Movement of fuel in the wing tanks caused by aircraft leveling can change the aircraft CG position. Therefore, it is recommended to remove all fuel from the aircraft before leveling. (See 05-10-00). This will also decrease the required lifting loads.

(17) Monitor the CG throughout the aircraft leveling process and be prepared to control with ballast if required (See TASK 03-50-01-558-803-A01).

(18) Monitor the position of the slings carefully at all times during the leveling/lifting process. For the fuselage lifting, it is necessary to install each sling at a frame station and all slings must be in the areas listed in DESC 06-50-00-001-A01.

(19) You must monitor and record applied loads at all times during the leveling and lifting process. If at one step of the process the maximum load (related to the lifting scenario) is more than the allowable load, contact Airbus for definition of structure inspection tasks. Airbus recommends that you use load cells and monitoring equipment to record the applied loads.

(20) Level or lift the aircraft slowly in accordance with the instructions given by the manufacturer of the lifting/leveling equipment and cranes.
Adjust the tethers as the fuselage starts to move.

(21) When the fuselage and the wing(s) are leveled and if it is necessary to lift the aircraft, it is recommended to use the 3 main jacking points to lift the aircraft to the necessary height, see 06-30-00. The aircraft should not be lifted until the entire aircraft (wing(s) and fuselage) is in a level attitude.

(22) When the aircraft is leveled and at the necessary height:

(a) Assemble a shoring device to support the fuselage and/or wings, or install jacks as a safety precaution if you work on the landing gear. Use shoring cradles on a prepared area. If specific tools are not available on site, you can use wood cribbing with rubber protections under the fuselage. In that case, the bearing area is the same as for pneumatic lifting bags installation, see 06-40-00.

(b) If possible on site, when the aircraft is on shoring cradles, extend the landing gear and install the downlock pins or repair or replace the landing gear, see TASK 02-30-01-481-802-A02.
Then prepare a roadway (see 07-20-00) and tow the aircraft (see 07-40-00).

(c) Or place the forward fuselage and/or the wing(s) on a mobile trailers if it not possible to make the landing gear serviceable.

(23) After the recovery operation, you must do an inspection of the skin surface and the wing(s) for any sign of damage which may have been caused during the leveling/lifting.

06-60 LEVELING AND LIFTING SCENARIOS

06-60-00 LEVELING AND LIFTING SCENARIOS

****ON A/C A330-200 A330-300**

DESC 06-60-00-001-A01

Introduction

1. General

There are 6 recovery scenarios:

Scenarios	Aircraft Attitude	Engines	Distortion	References
1.1	NLG Unserviceable	On A/C	No	See 06-60-01
1.2	NLG Unserviceable	On A/C	200 mm on Nose FWD Fuselage	See 06-60-01
2.1	One MLG Unserviceable	On A/C	200 mm on Nacelle	See 06-60-02
2.2	One MLG Unserviceable	LH Missing	No Wing Bending	See 06-60-02
3	NLG and One MLG Unserviceable	LH Missing	No Wing Bending	See 06-60-03
4	All L/G Unserviceable	On A/C	200 mm on Rear Fuselage and 200 mm on Nacelles	See 06-60-04

Recovery Scenarios

TABLE 1

Each recovery scenario is based on the assumptions that follow:

- The ground is horizontal and leveled,
- The soil is rigid,
- The A/C is rigid (no global bending of wing and fuselage),
- The aircraft has a local distortion of the fuselage and the nacelles of a maximum of 200 mm (7.87 in).

These assumptions are related to a critical operational CG because of the aircraft attitude. It is possible that the illustrations do not show the actual condition of the aircraft, but they give acceptable and important data.

2. Recovery Procedure

CAUTION : YOU MUST DO THE LATERAL LEVELING BEFORE YOU DO THE LONGITUDINAL LEVELING.

There are three general methods for leveling/lifting of the aircraft:

- Jacks, see 06-30-00,

- Pneumatic lifting bags, see 06-40-00,
- Cranes, see 06-50-00.

You must follow the safety precautions related to each recovery method.
In some cases, it can be necessary to level/lift the aircraft with use of a step-by-step combination of these three methods.
During the lateral or longitudinal leveling, the trajectories of the leveling/lifting points (the jacking point or the contact point of the pneumatic lifting bags) start from the first ground contact point from which the leveling is initiated and make a curve. This curve shows the displacement of the leveling/lifting point during the full leveling operation. The arc movement is calculated as follow, see 06-00-00:

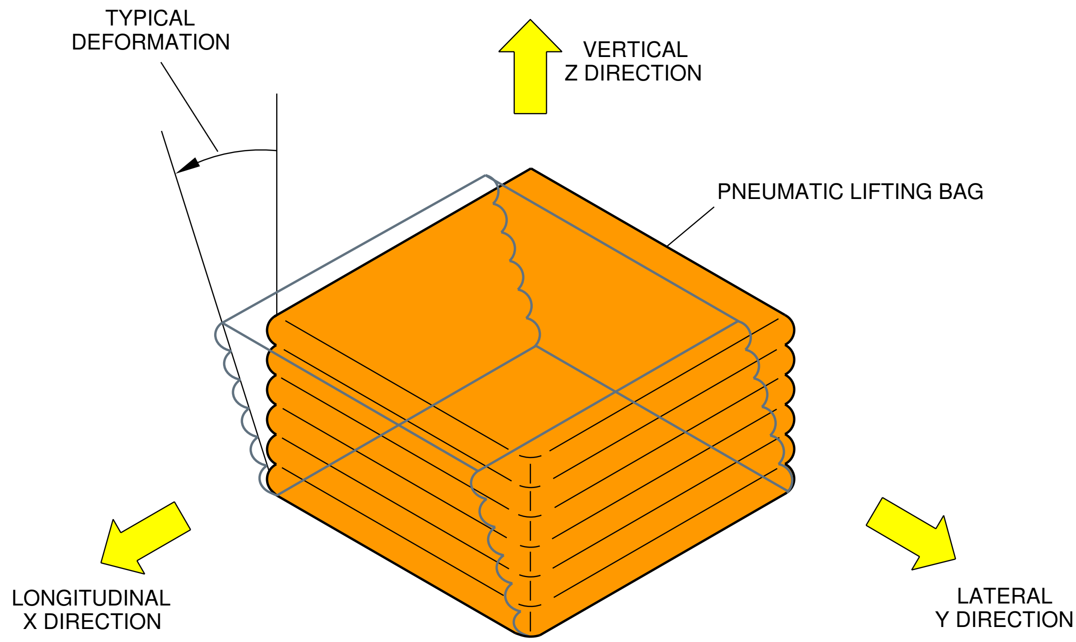
- Jacking: from the lowest position of the jacking point to its highest position with the aircraft at a leveled attitude,
- Airbags: from the lowest position of the middle point of the pneumatic lifting bags areas to the its highest position with the aircraft at a leveled attitude.

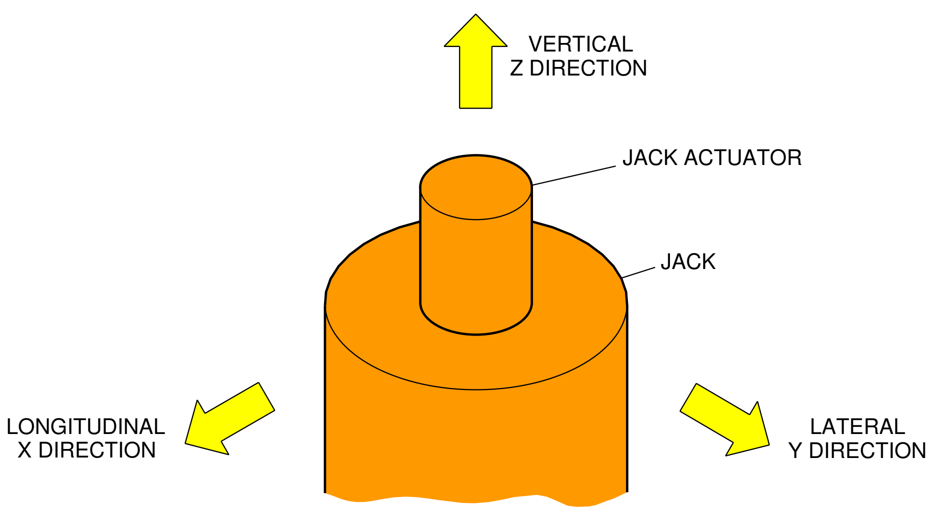
By arc movement, one must understand the total longitudinal and/or transverse movement of the lifting point, see FIGURE 06-60-00-991-001-A.
Make sure that the lifting device can follow the maximum travel range in all directions. It is important to know that the mentioned values are the result of a theoretical study and thus are average values and not accurate ones. It is necessary to make sure that the device you use will be able to hold the loads on the transverse displacements. For this reason, it is recommended to use a lifting device set to which you can apply a minimum of 150% of the necessary load.
With jacks, there is a risk of bending or rupture of the jack.
With pneumatic lifting bags, there is a risk of shear fracture of the bag.
During the leveling operation, the maximum applicable loads applied on the jacking points or on the contact area of the pneumatic lifting bags must not be more than the maximum allowable loads.
At all steps, it is necessary to accurately monitor the loads. The leveling should be linear and soft and it is necessary to control it continuously.
The description of each scenario has:

- An illustration which shows the A/C attitude with the pitch and roll angles and the coordinates of the contact points,
- An illustration which shows the clearances for the different methods to level/lift the aircraft. The 200 mm (7.87 in.) clearance and the related frame position are theoretically calculated to show the standard clearance which allow to install a deflated standard pneumatic lifting bag,
- An illustration which shows the arc movements related to the method used to lift the aircraft.

On these illustrations, for the longitudinal movement, the negative sign is related to a forward displacement. For the lateral movement, the negative sign is related to an inboard displacement.

**ON A/C A330-200 A330-300





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All Scenarios
Typical Transverse Movements
FIGURE-06-60-00-991-001-A01

06-60-01 SCENARIO 1 NLG UNSERVICEABLE

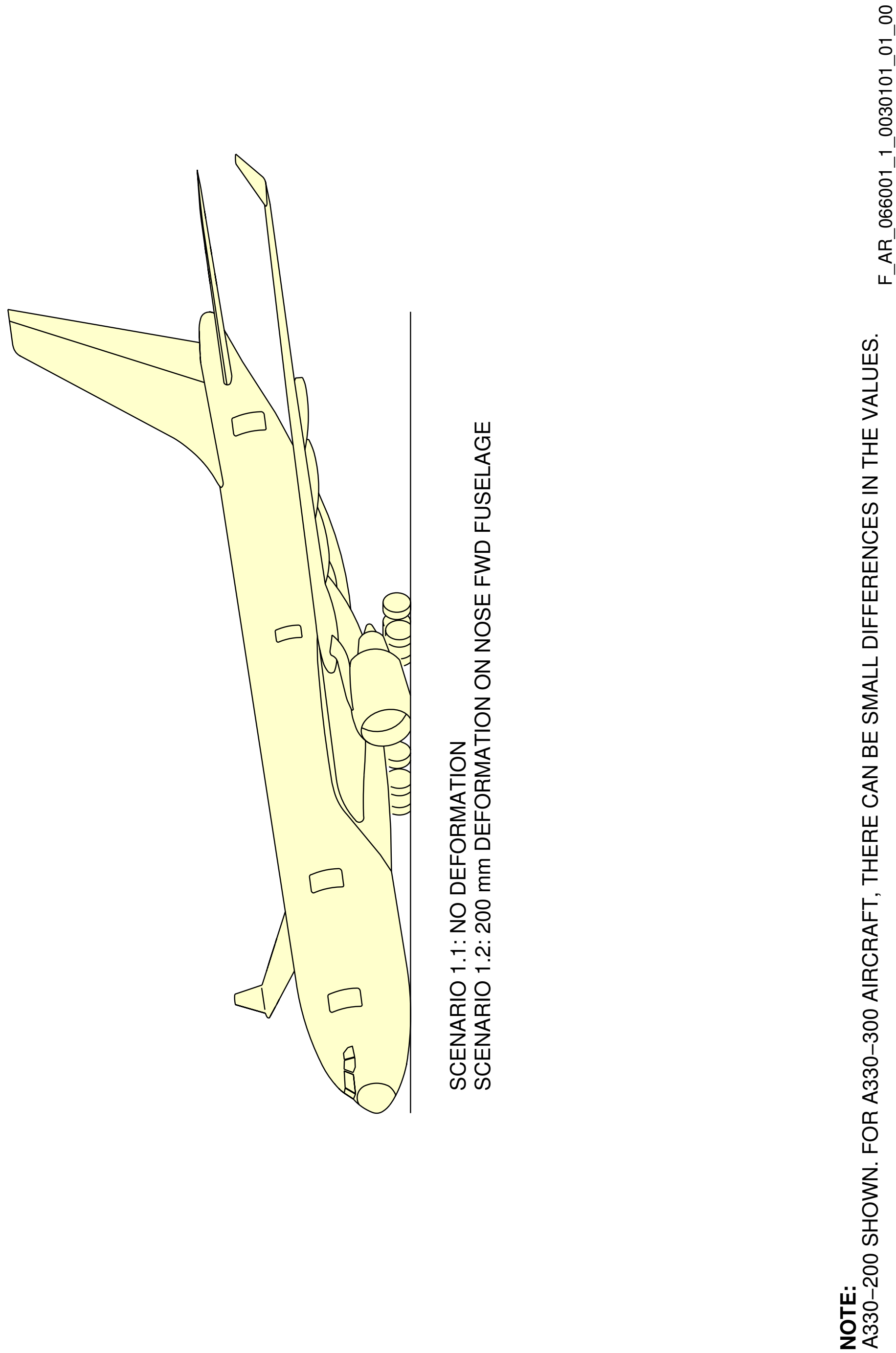
****ON A/C A330-200 A330-300**

DESC 06-60-01-001-A01

Scenario 1: NLG Unserviceable

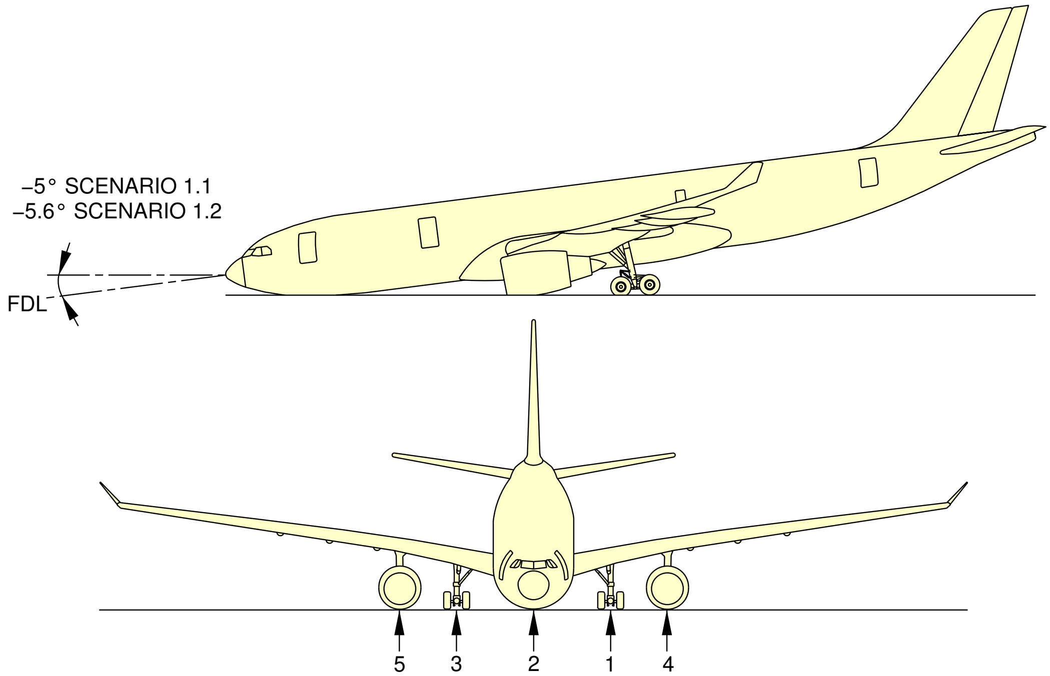
1. Aircraft Attitude
   See FIGURE 06-60-01-991-003-A.
2. Leveling/Lifting Clearances
   See FIGURE 06-60-01-991-004-A.
3. Arc Movements
   See FIGURE 06-60-01-991-005-A.

**ON A/C A330-200 A330-300



Scenario 1
NLG Unserviceable (Sheet 1 of 2)
FIGURE-06-60-01-991-003-A01

**ON A/C A330-200 A330-300



SCENARIO	THEORETICAL POINT OF CONTACT COORDINATES		X mm (in)	Y mm (in)
1.1	1	LH MLG WHEEL	35 234 (1 387)	–5 342 (–210)
	2	NOSE FUSELAGE	12 982 (511)	0
	3	RH MLG WHEEL	35 234 (1 387)	5 342 (210)
	OTHER THEORETICAL POINT OF CONTACT COORDINATES FOR INFORMATION		X mm (in)	Y mm (in)
	4	LH ENGINE	24 936 (982)	–9 263 (–365)
	5	RH ENGINE	24 936 (982)	9 263 (365)

SCENARIO	THEORETICAL POINT OF CONTACT COORDINATES		X mm (in)	Y mm (in)
1.2	1	LH MLG WHEEL	35 234 (1 387)	–5 342 (–210)
	2	NOSE FUSELAGE	12 757 (502)	0
	3	RH MLG WHEEL	35 234 (1 387)	5 342 (210)
	OTHER THEORETICAL POINT OF CONTACT COORDINATES FOR INFORMATION		X mm (in)	Y mm (in)
	4	LH ENGINE	24 918 (981)	–9 263 (–365)
	5	RH ENGINE	24 918 (981)	9 263 (365)

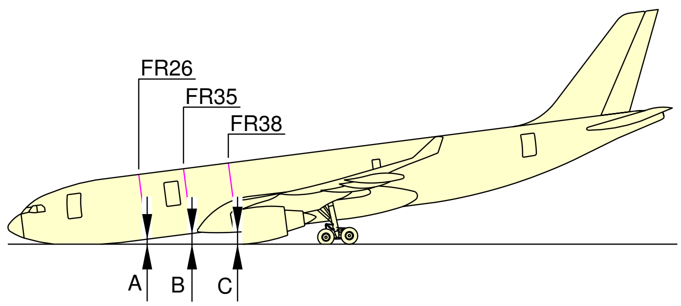
SCENARIO	PITCH ANGLE	ROLL ANGLE
1.1	–5°	ESTIMATED TO 0°
1.2	–5.6°	

NOTE:
A330–200 SHOWN. FOR A330–300 AIRCRAFT,
THERE CAN BE SMALL DIFFERENCES IN THE VALUES.

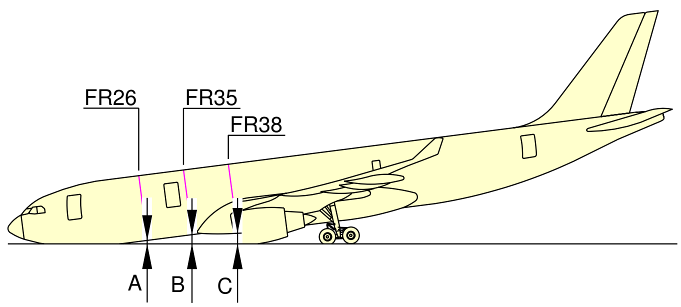
F_AR_066001_1_0030102_01_02

Scenario 1
Aircraft Attitude Data (Sheet 2 of 2)
FIGURE-06-60-01-991-003-A01

**ON A/C A330-200 A330-300



SCENARIO	LIFTING POINTS			THEORETICAL CLEARANCE Z mm (in)
1.1	A	PNEUMATIC LIFTING BAGS	FR26	344 (14)
	B		FR35	752 (30)
	C		FR38	931 (37)



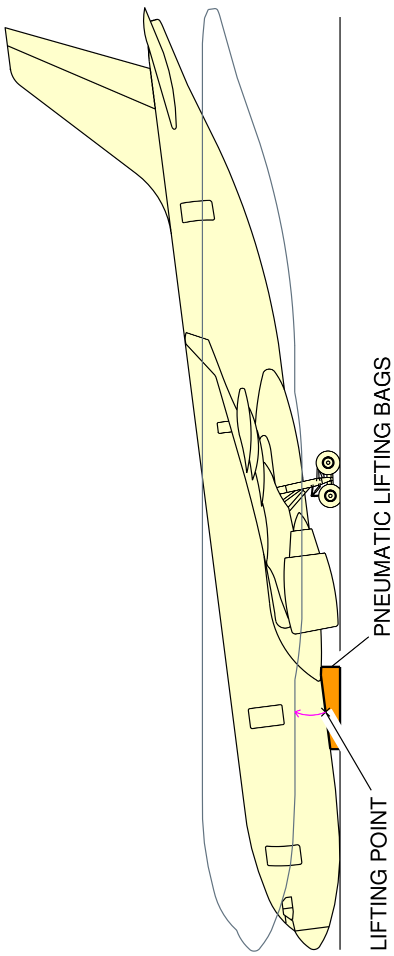
SCENARIO	LIFTING POINTS			THEORETICAL CLEARANCE Z mm (in)
1.2	A	PNEUMATIC LIFTING BAGS	FR26	200 (8)
	B		FR35	620 (24)
	C		FR38	839 (33)

NOTE:
A330–200 SHOWN. FOR A330–300 AIRCRAFT,
THERE CAN BE SMALL DIFFERENCES IN THE VALUES.

F_AR_066001_1_0040101_01_01

Scenario 1
Leveling/Lifting Clearances
FIGURE-06-60-01-991-004-A01

****ON A/C A330-200 A330-300**



SCENARIO	LOCATION	THEORETICAL DISPLACEMENT mm (in)		
		X	Y	Z
1.1	FR35	135 (5)	0	1 225 (48)
1.2	FR35	161 (6)	0	1 353 (53)

LIFTING WITH PNEUMATIC LIFTING BAGS

NOTE:
A330–200 SHOWN. FOR A330–300 AIRCRAFT, THERE CAN BE SMALL DIFFERENCES IN THE VALUES.

F_AR_066001_1_0050101_01_00

Scenario 1
Arc Movements
FIGURE-06-60-01-991-005-A01

06-60-02 SCENARIO 2 ONE MLG UNSERVICEABLE

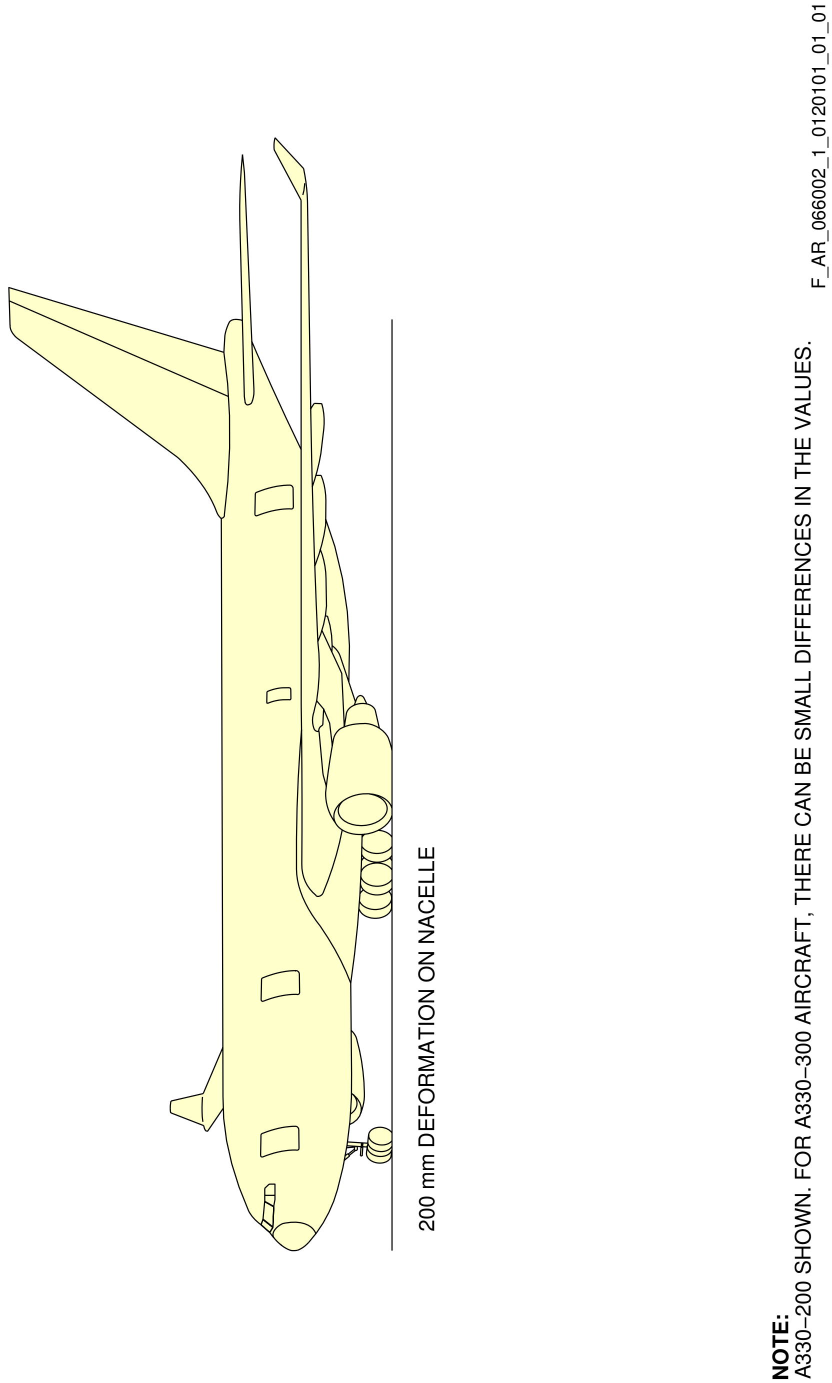
****ON A/C A330-200 A330-300**

DESC 06-60-02-001-A01

Scenario 2.1: One MLG Unserviceable

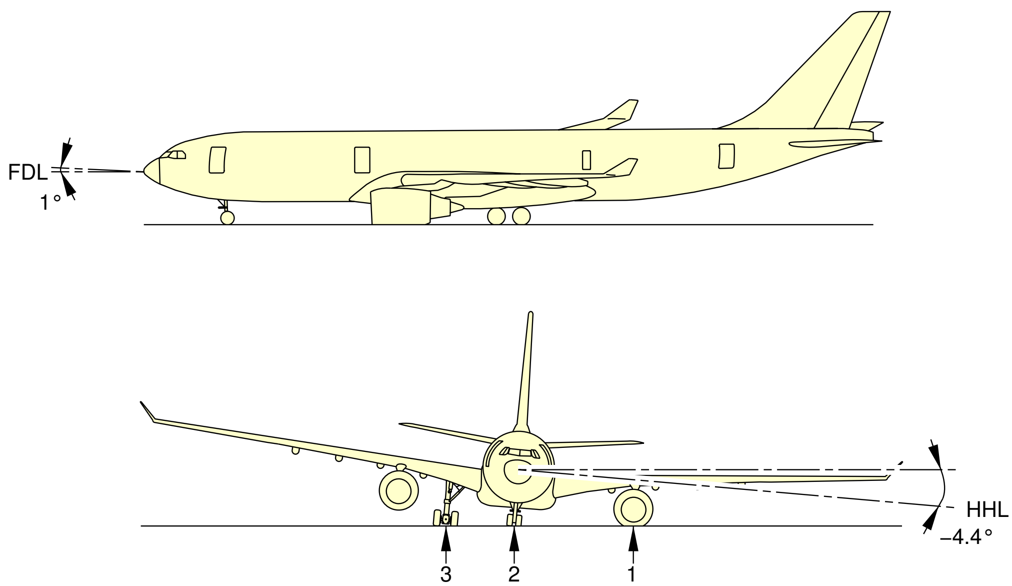
1. Aircraft Attitude
   See FIGURE 06-60-02-991-012-A.
2. Leveling/Lifting Clearances
   See FIGURE 06-60-02-991-013-A.
3. Arc Movements
   See FIGURE 06-60-02-991-014-A.

**ON A/C A330-200 A330-300



Scenario 2.1
One MLG Unserviceable (Sheet 1 of 2)
FIGURE-06-60-02-991-012-A01

**ON A/C A330-200 A330-300



THEORETICAL POINT OF CONTACT COORDINATES		X mm (in)	Y mm (in)
1	LH ENGINE	25 704 (1 012)	–9 374 (–369)
2	NLG WHEEL	13 053 (514)	0
3	RH MLG WHEEL	35 234 (1 387)	5 342 (210)

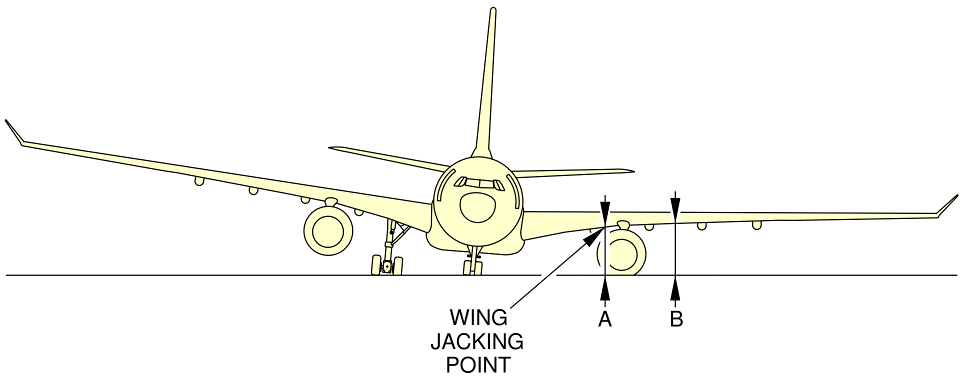
PITCH ANGLE	ROLL ANGLE
1°	–4.4°

NOTE:
A330–200 SHOWN. FOR A330–300 AIRCRAFT,
THERE CAN BE SMALL DIFFERENCES IN THE VALUES.

F_AR_066002_1_0120102_01_02

Scenario 2.1
Aircraft Attitude Data (Sheet 2 of 2)
FIGURE-06-60-02-991-012-A01

**ON A/C A330-200 A330-300



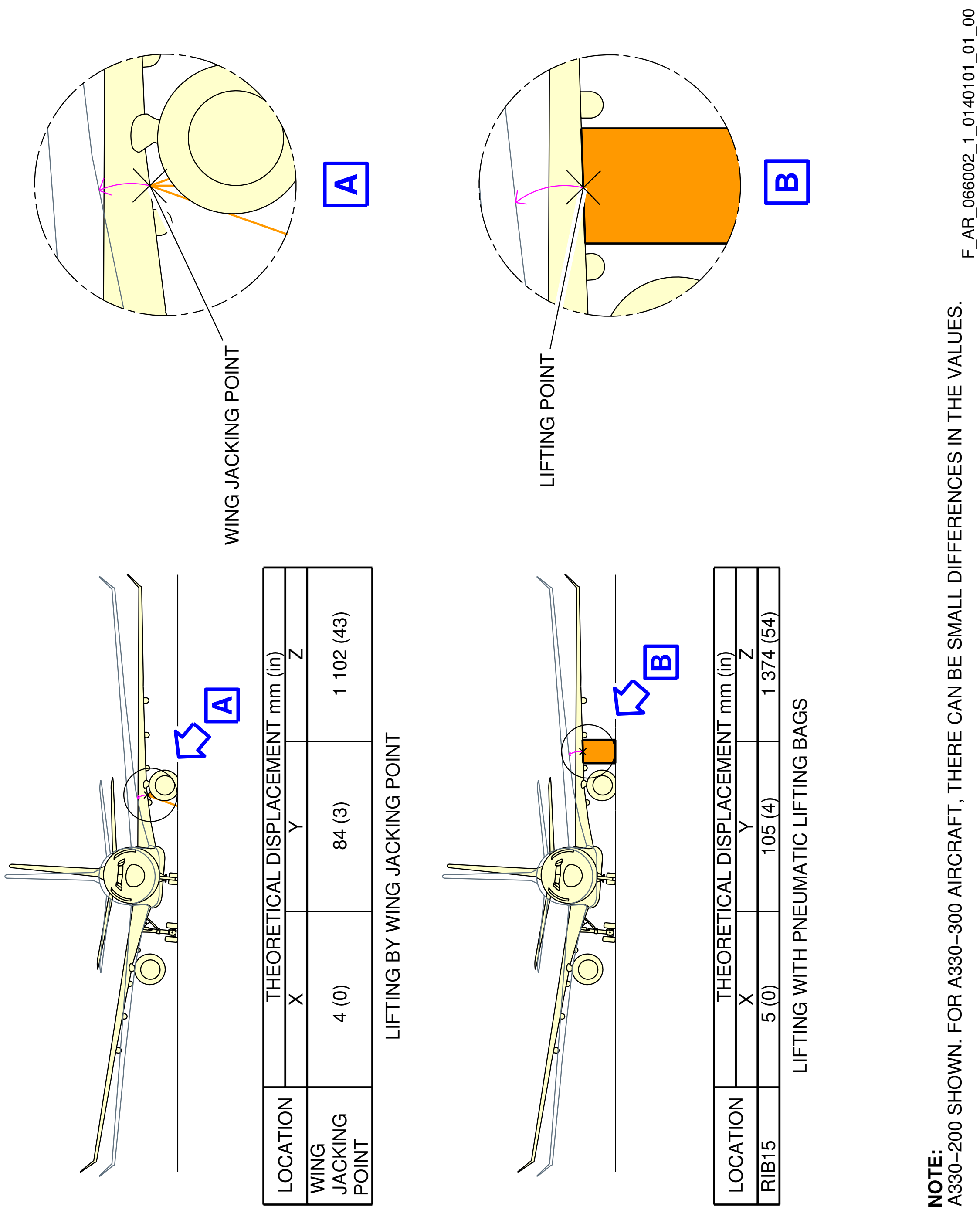
LIFTING POINTS			THEORETICAL CLEARANCE Z mm (in)
A	JACK	WING JACKING POINT	3 342 (132)
B	PNEUMATIC LIFTING BAGS	RIB15	3 384 (133)

NOTE:
A330−200 SHOWN. FOR A330−300 AIRCRAFT,
THERE CAN BE SMALL DIFFERENCES IN THE VALUES.

F_AR_066002_1_0130101_01_01

Scenario 2.1
Leveling/Lifting Clearances
FIGURE-06-60-02-991-013-A01

**ON A/C A330-200 A330-300



LOCATION	THEORETICAL DISPLACEMENT mm (in)		
	X	Y	Z
WING JACKING POINT	4 (0)	84 (3)	1 102 (43)

LOCATION	THEORETICAL DISPLACEMENT mm (in)		
	X	Y	Z
RIB15	5 (0)	105 (4)	1 374 (54)

Scenario 2.1
Arc movements
FIGURE-06-60-02-991-014-A01

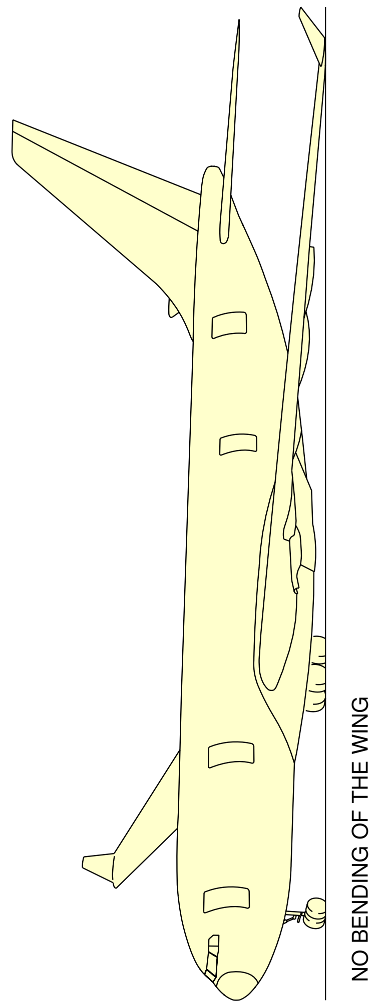
****ON A/C A330-200 A330-300**

DESC 06-60-02-002-A01

Scenario 2.2: One MLG Unserviceable and Engine Missing

1. Aircraft Attitude
   See FIGURE 06-60-02-991-006-A.
2. Leveling/Lifting Clearances
   See FIGURE 06-60-02-991-007-A.
3. Arc Movements
   See FIGURE 06-60-02-991-008-A.

**ON A/C A330-200 A330-300



NOTE:
A330–200 SHOWN. FOR A330–300 AIRCRAFT, THERE CAN BE SMALL DIFFERENCES IN THE VALUES.

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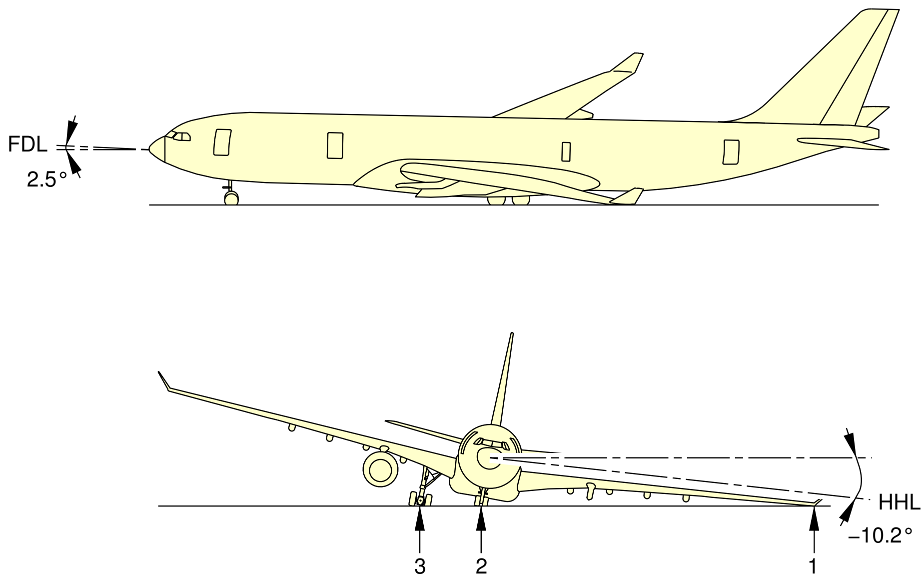
Scenario 2.2
One MLG Unserviceable and Engine Missing (Sheet 1 of 2)
FIGURE-06-60-02-991-006-A01

**ON A/C A330-200 A330-300



THEORETICAL POINT OF CONTACT COORDINATES		X mm (in)	Y mm (in)
1	LH WING TIP	42 986 (1 692)	–28 849 (–1 136)
2	NLG WHEEL	13 053 (514)	0
3	RH MLG WHEEL	35 234 (1 387)	5 342 (210)

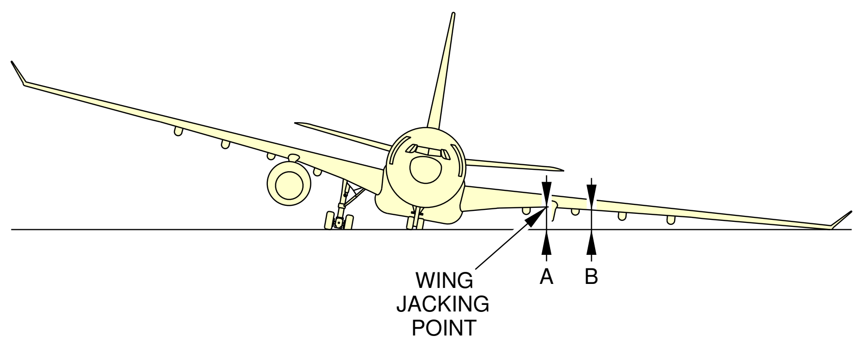
PITCH ANGLE	ROLL ANGLE
2.5°	–10.2°

NOTE:
A330–200 SHOWN. FOR A330–300 AIRCRAFT,
THERE CAN BE SMALL DIFFERENCES IN THE VALUES.

F_AR_066002_1_0060102_01_02

Scenario 2.2
Aircraft Attitude Data (Sheet 2 of 2)
FIGURE-06-60-02-991-006-A01

**ON A/C A330-200 A330-300



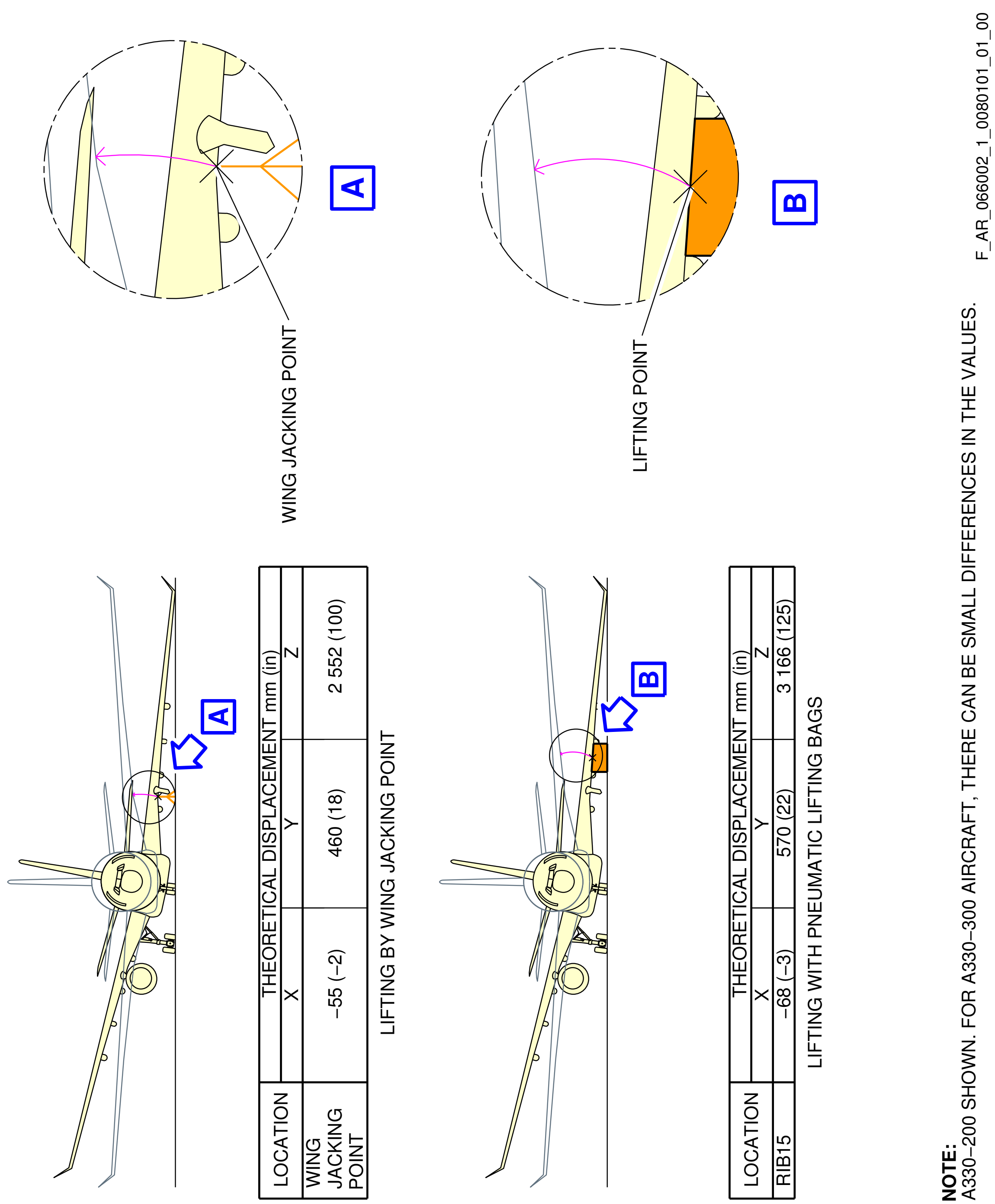
LIFTING POINTS			THEORETICAL CLEARANCE Z mm (in)
A	JACK	WING JACKING POINT	1 898 (75)
B	PNEUMATIC LIFTING BAGS	RIB15	1 546 (61)

NOTE:
A330−200 SHOWN. FOR A330−300 AIRCRAFT,
THERE CAN BE SMALL DIFFERENCES IN THE VALUES.

F_AR_066002_1_0070101_01_01

Scenario 2.2
Leveling/Lifting Clearances
FIGURE-06-60-02-991-007-A01

**ON A/C A330-200 A330-300



LOCATION	THEORETICAL DISPLACEMENT mm (in)		
	X	Y	Z
WING JACKING POINT	–55 (–2)	460 (18)	2 552 (100)

LIFTING BY WING JACKING POINT

LOCATION	THEORETICAL DISPLACEMENT mm (in)		
	X	Y	Z
RIB15	–68 (–3)	570 (22)	3 166 (125)

LIFTING WITH PNEUMATIC LIFTING BAGS

Scenario 2.2
Arc Movements
FIGURE-06-60-02-991-008-A01

06-60-03 SCENARIO 3 NLG AND ONE MLG UNSERVICEABLE

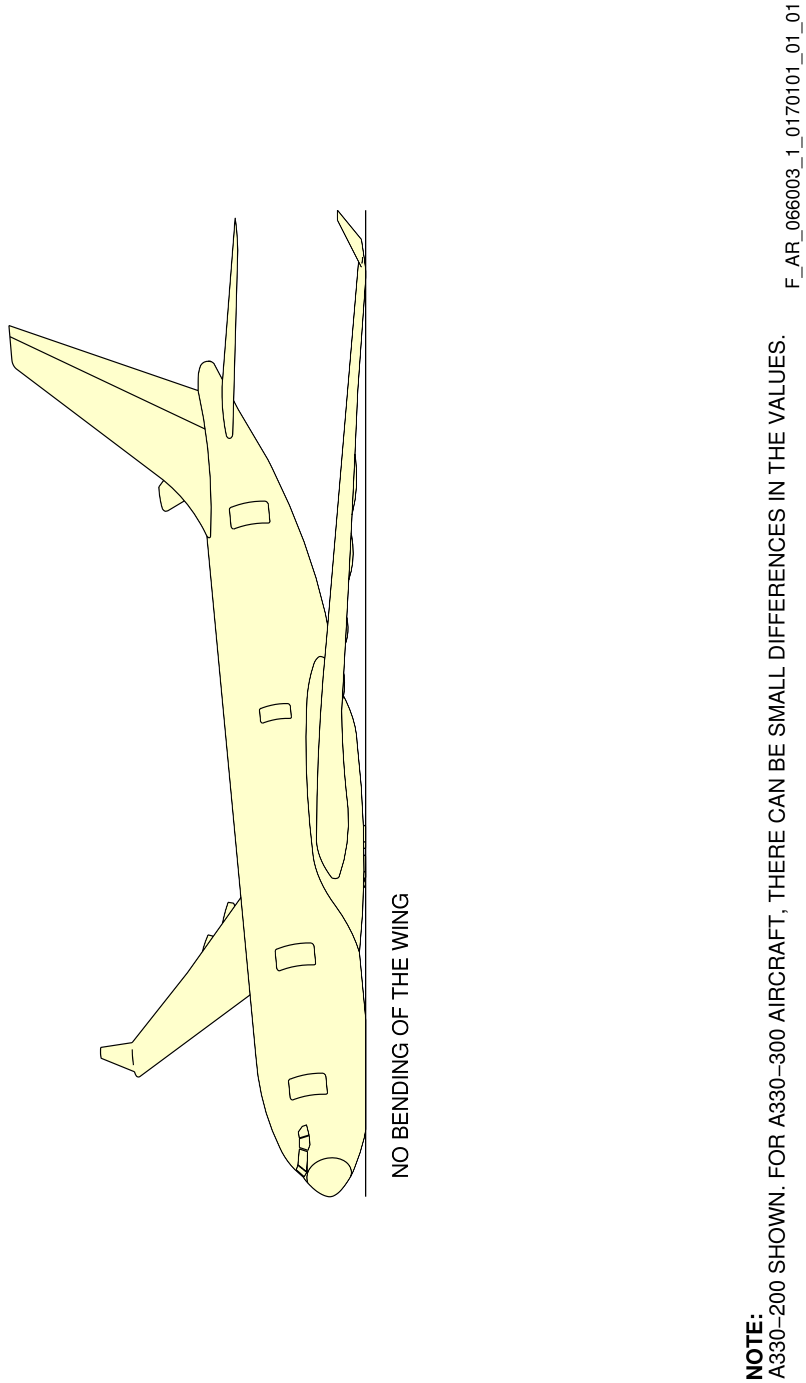
****ON A/C A330-200 A330-300**

DESC 06-60-03-002-A01

Scenario 3: NLG and One MLG Unserviceable and Engine Missing

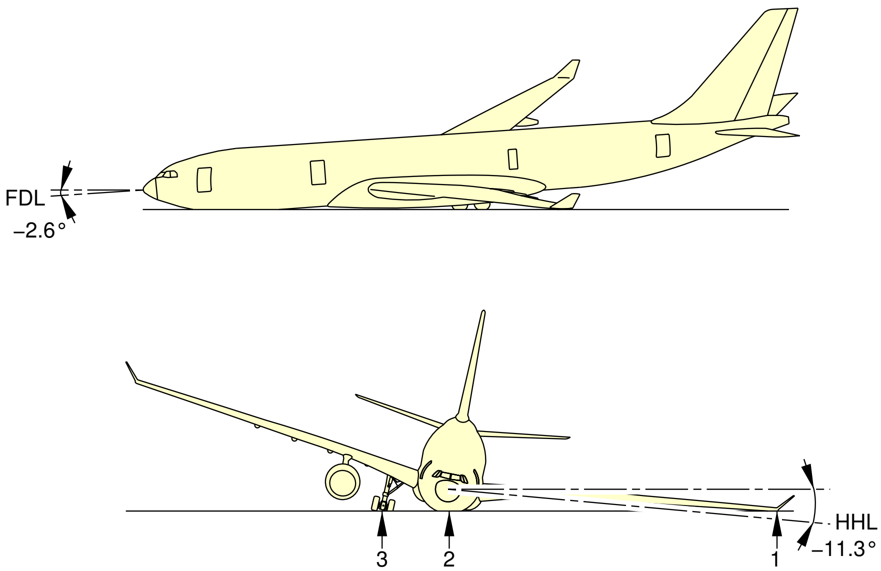
1. Aircraft Attitude
   Scenario 3 has two steps:
   - for Step 1, see FIGURE 06-60-03-991-017-A,
   - for Step 2, see 06-60-01 Scenario 1.2.
2. Leveling/Lifting Clearances
   Scenario 3 has two steps:
   - for Step 1, see FIGURE 06-60-03-991-018-A,
   - for Step 2, see 06-60-01 Scenario 1.2.
3. Arc Movements
   Scenario 3 has two steps:
   - for Step 1, see FIGURE 06-60-03-991-019-A,
   - for Step 2, see 06-60-01 Scenario 1.2.

**ON A/C A330-200 A330-300



Scenario 3
NLG and One MLG Unserviceable and Engine Missing (Sheet 1 of 2)
FIGURE-06-60-03-991-017-A01

**ON A/C A330-200 A330-300



THEORETICAL POINT OF CONTACT COORDINATES		X mm (in)	Y mm (in)
1	LH WING TIP	42 648 (1 679)	–28 810 (–1 134)
2	NOSE FUSELAGE	14 249 (561)	–500 (–20)
3	RH MLG WHEEL	35 234 (1 387)	5 342 (210)

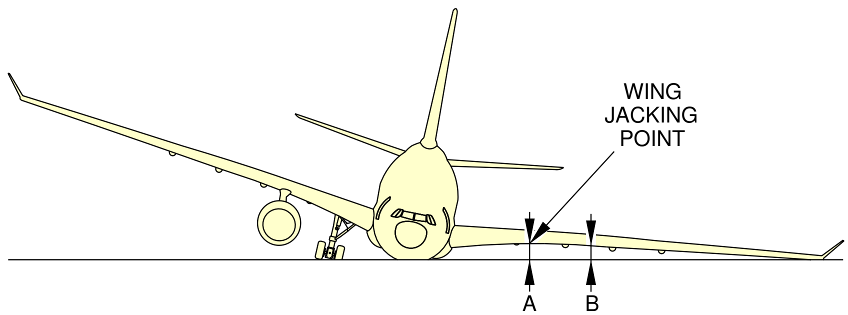
PITCH ANGLE	ROLL ANGLE
–2.6°	–11.3°

NOTE:
A330–200 SHOWN. FOR A330–300 AIRCRAFT,
THERE CAN BE SMALL DIFFERENCES IN THE VALUES.

F_AR_066003_1_0170102_01_01

Scenario 3
Aircraft Attitude Data (Sheet 2 of 2)
FIGURE-06-60-03-991-017-A01

**ON A/C A330-200 A330-300



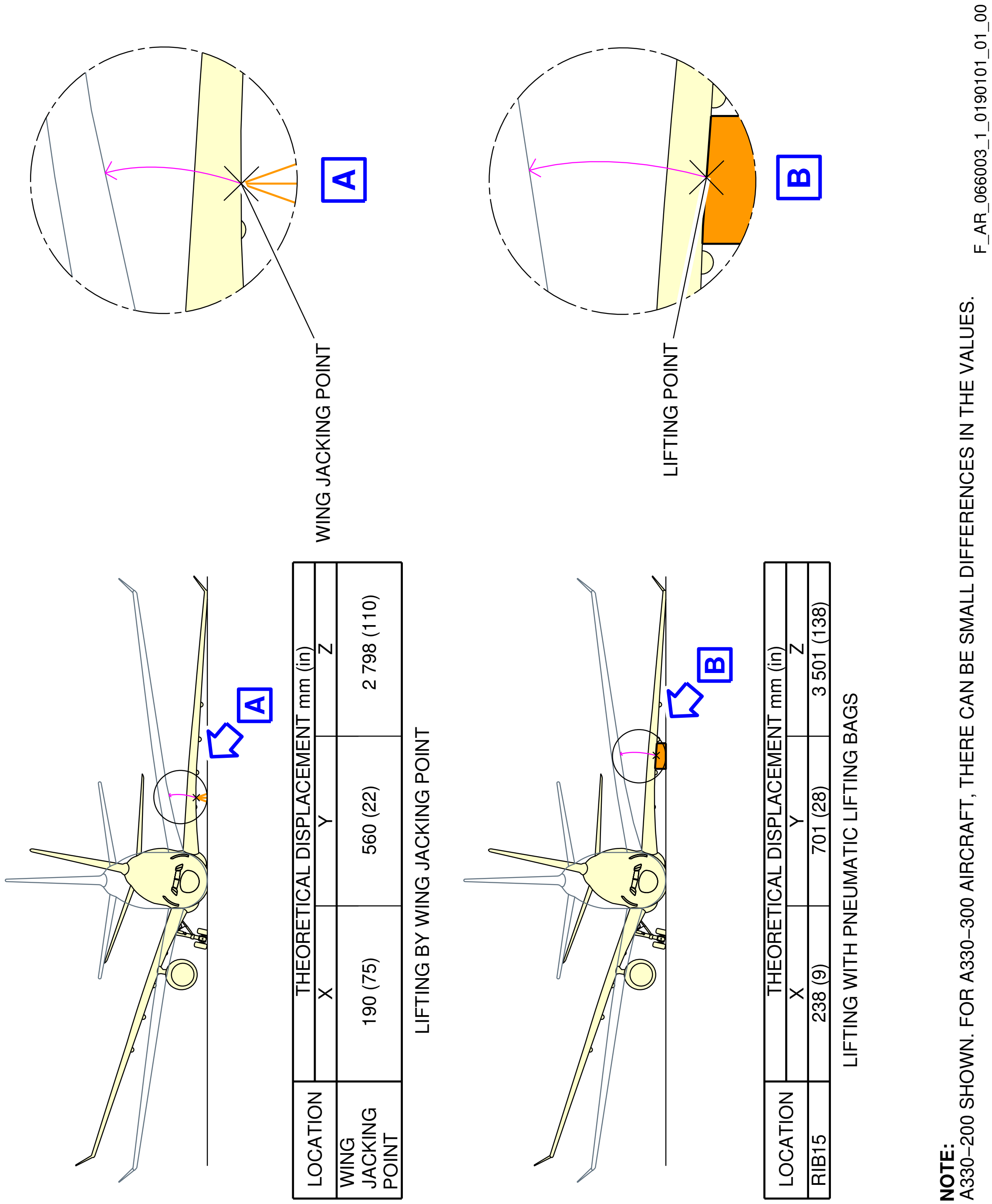
LIFTING POINTS			THEORETICAL CLEARANCE Z mm (in)
A	JACK	WING JACKING POINT	1 580 (62)
B	PNEUMATIC LIFTING BAGS	RIB15	1 125 (44)

NOTE:
A330−200 SHOWN. FOR A330−300 AIRCRAFT,
THERE CAN BE SMALL DIFFERENCES IN THE VALUES.

F_AR_066003_1_0180101_01_01

Scenario 3
Leveling/Lifting Clearances
FIGURE-06-60-03-991-018-A01

**ON A/C A330-200 A330-300



LOCATION	THEORETICAL DISPLACEMENT mm (in)		
	X	Y	Z
WING JACKING POINT	190 (75)	560 (22)	2 798 (110)

LOCATION	THEORETICAL DISPLACEMENT mm (in)		
	X	Y	Z
RIB15	238 (9)	701 (28)	3 501 (138)

Scenario 3
Arc Movements
FIGURE-06-60-03-991-019-A01

06-60-04 SCENARIO 4 ALL L/G UNSERVICEABLE

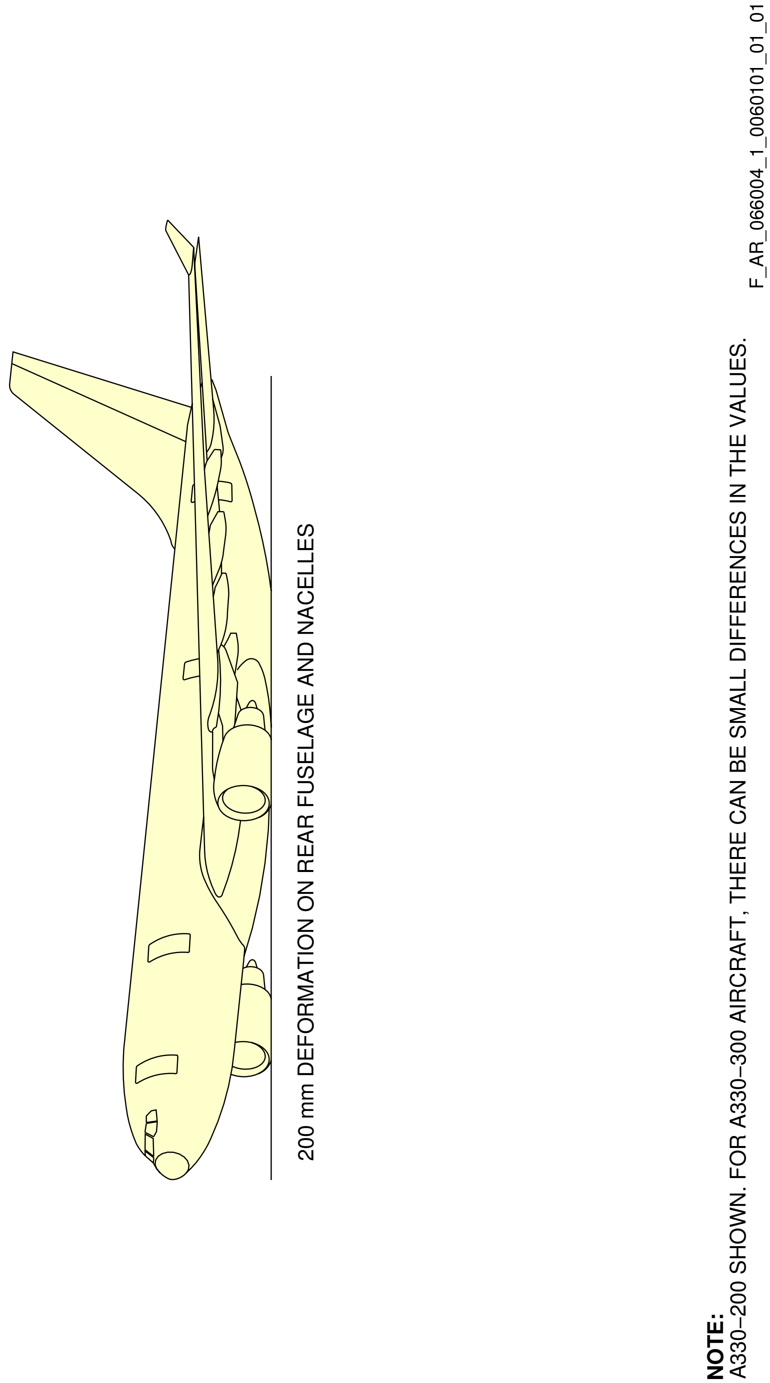
****ON A/C A330-200 A330-300**

DESC 06-60-04-001-A01

Scenario 4: All L/G Unserviceable

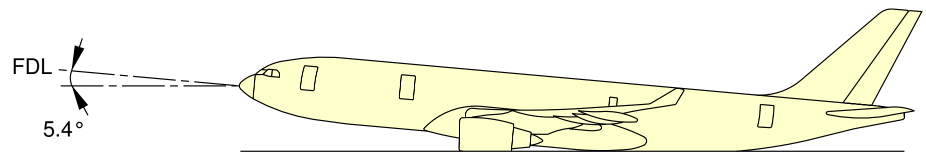
1. Aircraft Attitude
   See FIGURE 06-60-04-991-006-A.
2. Leveling/Lifting Clearances
   See FIGURE 06-60-04-991-007-A.

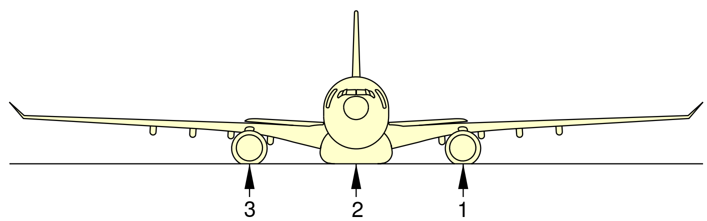
**ON A/C A330-200 A330-300



Scenario 4
All L/G Unserviceable (Sheet 1 of 2)
FIGURE-06-60-04-991-006-A01

**ON A/C A330-200 A330-300





THEORETICAL POINT OF CONTACT COORDINATES		X mm (in)	Y mm (in)
1	LH ENGINE	26 309 (1 036)	–9 283 (–365)
2	REAR FUSELAGE	45 676 (1 798)	0
3	RH ENGINE	26 309 (1 036)	9 283 (365)

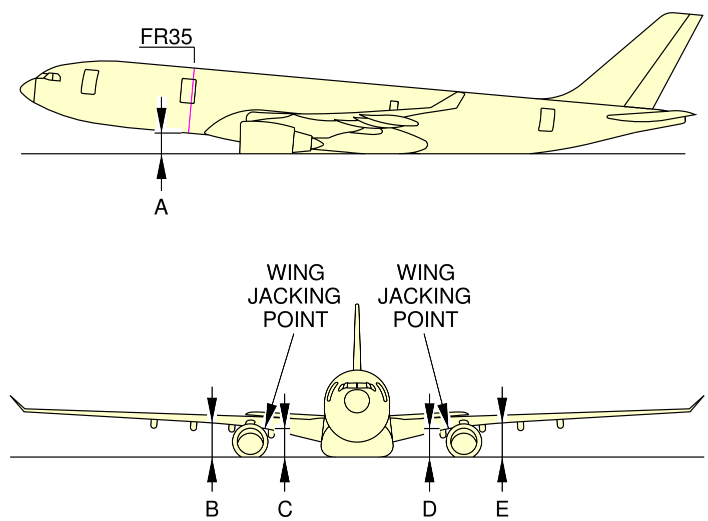
PITCH ANGLE	ROLL ANGLE
5.4°	ESTIMATED TO 0°

NOTE:
A330–200 SHOWN. FOR A330–300 AIRCRAFT,
THERE CAN BE SMALL DIFFERENCES IN THE VALUES.

F_AR_066004_1_0060102_01_02

Scenario 4
Aircraft Attitude Data (Sheet 2 of 2)
FIGURE-06-60-04-991-006-A01

**ON A/C A330-200 A330-300



LIFTING POINTS			THEORETICAL CLEARANCE Z mm (in)
A	PNEUMATIC LIFTING BAGS	FR35	1 473 (58)
B		RIB15 ON RH WING	2 950 (116)
C	JACKS	RH WING JACKING POINT	2 612 (103)
D		LH WING JACKING POINT	2 612 (103)
E	PNEUMATIC LIFTING BAGS	RIB15 ON LH WING	2 950 (116)

NOTE:
A330−200 SHOWN. FOR A330−300 AIRCRAFT,
THERE CAN BE SMALL DIFFERENCES IN THE VALUES.

F_AR_066004_1_0070101_01_01

Scenario 4
Leveling/Lifting Clearances
FIGURE-06-60-04-991-007-A01

MOVING THE AIRCRAFT

07-00 MOVING THE AIRCRAFT

07-00-00 MOVING THE AIRCRAFT

****ON A/C A330-200 A330-300**

DESC 07-00-00-002-A01

General Preparation

1. General
   This chapter gives the procedures for moving the aircraft to a hard surface. There are different procedures for moving the aircraft if the landing gear is serviceable, or if it is damaged.
   A. Before moving the aircraft you must:
      - Do a detailed inspection of the landing gear to confirm its structural integrity. The landing gear must be capable of supporting the weight of the aircraft during Towing/Debogging operations, see 02-30-01.
      - Do a check to make sure that the landing gear is in the downlocked position with the groundlock pins fitted. If it is not possible to fit the groundlock pins, a more detailed inspection must be done to find the cause. See 02-30-01 for groundlock pin installation details.
   B. Use one of the following procedures when the landing gear is damaged or missing:
      - Repair or replace the landing gear to make it capable of supporting the aircraft weight during Towing/Debogging operations.
      - Use an aircraft recovery transport vehicle or vehicles to move the aircraft. See 07-60-00.
   C. Before moving the aircraft, make sure that:
      - Fuel and cargo have been removed to make the aircraft as light as possible.
      - The weight and Center of Gravity (CG) are adequate for towing stability, see TBD.
      - The relevant authorities have confirmed that the aircraft can be moved.
      - The airport authority and fire department have been told that the recovery process has moved to the next phase.
      - There are no fluid leaks.
2. Returning Undamaged Aircraft to a Hard Surface
   A planned recovery will allow the undamaged aircraft to be returned to the runway in the least possible time.
   A. The recovery plan can include:
      - Confirmation that the aircraft is in the correct condition to be moved.
      - The need to remove fuel and cargo from the aircraft.
      - The type of ground over which the aircraft must be moved.
      - The direction in which the aircraft will be moved.
      - The type and quantity of ground equipment and recovery vehicles needed.

B. The following procedures may be necessary to return an undamaged aircraft to the runway or taxiway:
- For an aircraft that has moved onto soft ground or snow, it may be necessary to use the Debogging procedure, 07-40-00 and the procedure to prepare a roadway 07-20-00. When a roadway is prepared, the width of the roadway must be sufficient to let the towing vehicle turn the aircraft if necessary.
- To make sure that the towing loads are not exceeded; use a load measuring tool to monitor the loads at all times.
- To make sure that the Debogging loads are not exceeded; use a load measuring tool to monitor the loads at all times unless the fuse assembly is being used, see 07-40-04.

07-20 PREPARING A ROADWAY

07-20-00 PREPARING A ROADWAY

****ON A/C A330-200 A330-300**

DESC 07-20-00-001-A01

Preparing a Roadway

1. For each aircraft recovery, the recovery manager must contact the relevant specialists to obtain correct data applicable to the ground strength.
   If the aircraft has moved off the runway or taxiway, it may be necessary to build a roadway to move the aircraft on.
   The roadway must be excavated to a depth that will let the finished roadway safely support the weight of the aircraft.
   The width of the roadway must let the aircraft be turned as necessary and let the routing of the aircraft be changed. The width of the roadway must let heavy recovery vehicles manoeuvre safely.

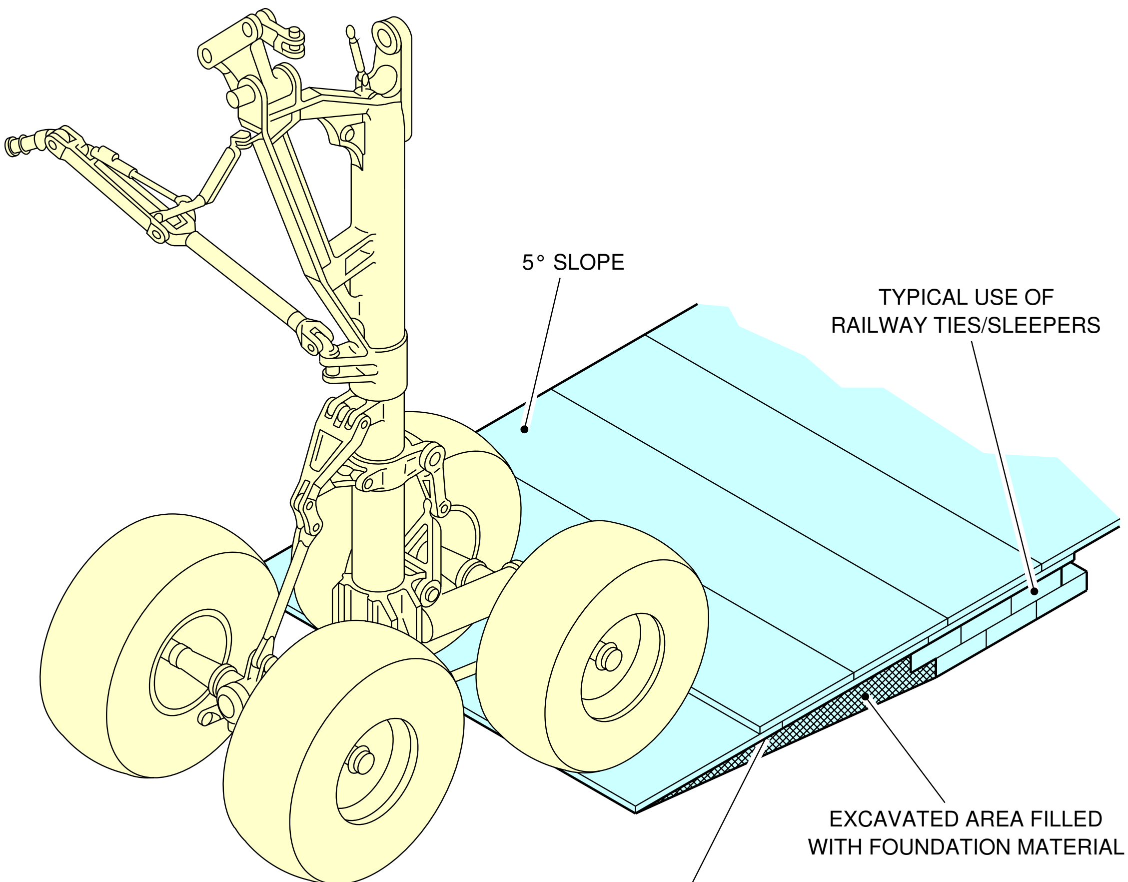
   NOTE : The information or principle contained in this chapter are given as a guide to assist an aircraft recovery.

2. If the ground is soft or is not stable, you must excavate the ground along the route to the runway and build a roadway. If the aircraft wheels have made ruts that are not too deep, the ruts can be filled with a foundation material.
   This material can be compacted gravel or railway ties/sleepers covered with sheet steel or thick plywood, see FIGURE 07-20-00-991-001-A.
   See chapter 04-50-00 for information on soil characteristics. Normally, general construction contractors will have sufficient knowledge and experience to make a safe roadway.
   Some of the materials that can be used in the construction of a roadway are:
   - Compacted stone, gravel and/or broken asphalt,
   - Railway ties/sleepers,
   - Sheet steel,
   - Plywood

   See chapter 09-30-01 for details of materials that can be used for the recovery operation. You must make sure that materials used for recovery are safe to be used, can cope with the forecasted weather conditions and will not break under load or cause a change in aircraft stability.
   When sheet material is used on top of the compacted material, it is recommended that two layers of sheet material are used. Lay the sheets with the joints of the bottom layer covered by the top layer, see FIGURE 07-20-00-991-001-A and FIGURE 07-20-00-991-002-A. When using sheet steel be careful to avoid fluid spills. Fluid spills on sheet steel can cause a loss of towing traction for the towing vehicles and will be a hazard for the recovery team.
   Steel or aluminum sections that can be bolted together are available commercially in most cities. Fabric matting that is made of different types of glass fibre is also available commercially. There are different types, sizes and strengths of these materials.

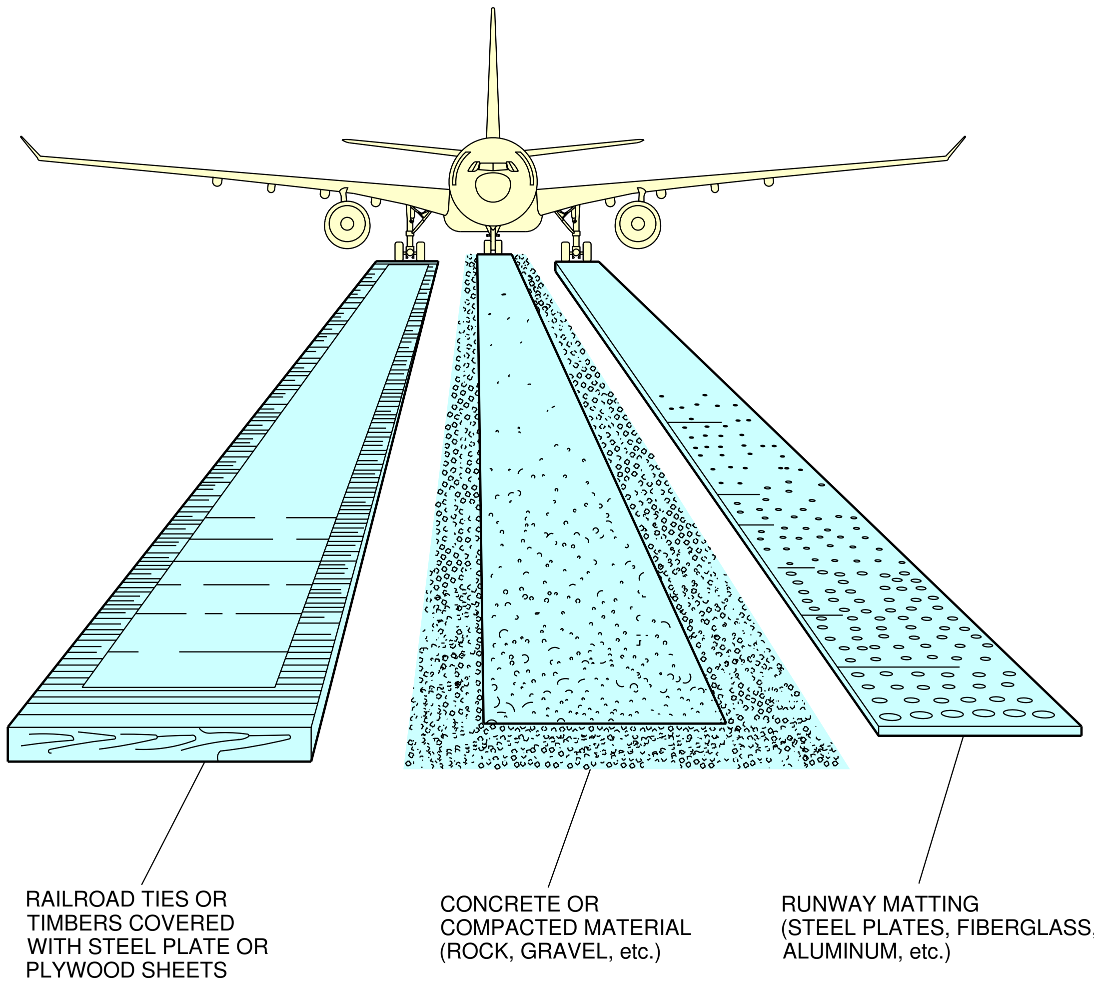
If there is not sufficient sheet material to make the roadway, the materials that the aircraft has been moved over can be re-used to complete the roadway.
If heavy timbers are used directly on the roadway, they must be covered with a layer of plywood or steel. If this is not done, the load from individual wheels can push one of the timbers into soft ground and cause the aircraft to stop.
When the ground is not level, the roadway must normally be made with a slope of 5° or less. If possible, position the towing/winching vehicle on the runway to give maximum traction.

**ON A/C A330-200 A330-300



Preparing a Roadway
Typical Roadway Construction
FIGURE-07-20-00-991-001-A01

**ON A/C A330-200 A330-300



Preparing a Roadway
Typical Roadway Construction
FIGURE-07-20-00-991-002-A01

07-40 TOWING AND DEBOGGING

07-40-00 TOWING AND DEBOGGING

****ON A/C A330-200 A330-300**

DESC 07-40-00-001-A01

General

1. This chapter gives the towing procedures to be used during an aircraft recovery.

   WARNING : STAY IN COMMUNICATION WITH THE AIRFIELD OPERATING AUTHORITY/AIR TRAFFIC CONTROLLER DURING THIS PERIOD AND GET THEIR PERMISSION TO MOVE THE AIRCRAFT.

   - For towing load and angle limits, see 07-40-04.
   - For towing from the nose gear, see 07-40-01.
   - For towing from the main gear, see 07-40-02.
   - For towing with deflated tires, see 07-40-03.

   For AMM towing procedure, see AMM 09-10-00PB201.

2. Debogging definition:
   Airbus considers that debogging is towing in an abnormal situation, with or without slope consideration.

07-40-01 TOWING FROM THE NOSE LANDING GEAR

****ON A/C A330-200 A330-300**

TASK 07-40-01-584-801-A01

Towing from the NLG with a Towbar

1. General
   This procedure gives details to push the aircraft rearward or to tow the aircraft forward using a towbar installed on the NLG.
2. Inspections
   - Make sure that the safety devices are installed on the landing gears, TASK 02-30-01-481-802-A02.
   - Make sure that the aircraft is stable, see TASK 04-20-00-588-801-A01 or AMM 05-57-00-200-801.
   - Make sure that the engine cowl are closed.
   - Make sure that the H-dimension of the NLG is not more than 310 mm (12.20 in). See 07-40-04.
3. Job Setup References
   For towing limits, see 07-40-04.
4. Job Set-up Information
   A. Fixtures, Tools, Test and Support Equipment

REFERENCE	DESIGNATION
D23156000	PIN-SAFETY

Fixtures, Tools, Test and Support Equipment

TABLE 1

   B. Referenced Information

REFERENCE	DESIGNATION
TASK 02-30-01-481-802-A02	TASK 02-30-01-481-802-A02-Installation of the Safety Devices on Landing Gears
TASK 04-20-00-588-801-A01	TASK 04-20-00-588-801-A01-Stabilizing the Aircraft
07-40-04	07-40-04-TOWING LOAD LIMITS
AMM 05-57-00-200-801	
AMM 31-60-00-860-801	
AMM 29-00-00-863-802	
FIGURE 07-40-01-991-002-A	FIGURE 07-40-01-991-002-A-Towing from the NLG

REFERENCE	DESIGNATION
FIGURE 07-40-01-991-001-A	FIGURE 07-40-01-991-001-A-Towing from the NLG

Referenced Information

TABLE 2

5. Procedure

Subtask 07-40-01-500-001-A01

A. Preparation

(1) If possible, do an EIS start procedure, see AMM 31-60-00-860-801.

(2) On the Nose Wheel Steering deactivation electrical-box 5GC (see FIGURE 07-40-01-991-002-A):

(a) Set the ground-towing control lever to the towing position.

(b) Install the D23156000 PIN-SAFETY.

Subtask 07-40-01-500-002-A01

B. Installation of the Towbar

CAUTION : MAKE SURE THAT THE TOW BAR HAS A DAMPING SYSTEM, A CALIBRATED SHEAR PIN AND TWO CALIBRATED TURN SHEAR PINS. THIS IS TO PREVENT HIGH LOADS WHICH CAN CAUSE DAMAGE TO THE LANDING GEAR.

(1) Install the towbar on the tow fitting.

(2) Connect the towbar to the tractor. See FIGURE 07-40-01-991-001-A.

Subtask 07-40-01-869-001-A01

C. Aircraft Configuration

(1) On the panel 312VU, on the triple pressure indicator:
- Make sure that the pointer of the top gauge (ACCU PRESS) is in the green range 3000 psi (206.8427 bar).
- If necessary, pressurize the Blue Hydraulic System (see AMM 29-00-00-863-802).

(2) On the panel 117VU, set the PARKING-BRK control-switch to OFF.

(3) Pressurize the Blue Hydraulic System during the towing operation (see AMM 29-00-00-863-802).

(4) Remove the wheel chocks from the main landing gear wheels and nose landing gear wheels.

Subtask 07-40-01-584-001-A01

D. Towing

WARNING : DURING TOWING / TAXIING OPERATION (LOW-SPEED OPERATION INCLUDED), EACH PERSON IN THE AIRCRAFT MUST BE IN A SEAT AND THE SEAT BELT MUST BE FASTENED. IF THE SEAT BELT IS NOT FASTENED, THERE IS A RISK OF INJURY IF THE AIRCRAFT STOPS SUDDENLY.

CAUTION : PUT THE PARKING BRAKE CONTROL SWITCH IN THE OFF POSITION BEFORE YOU TOW OR PUSH BACK THE AIRCRAFT. THIS IS TO PREVENT HIGH LOADS WHICH CAN CAUSE DAMAGE TO THE NOSE LANDING GEAR.

(1) Tow slowly and smoothly.
During the towing operations, put:
- one person in the cockpit to operate the brakes if necessary,
- two persons to monitor the wing tips.

NOTE : The shock absorber reaction can cause the aircraft to move forward and rearward when you stop the wheels. Because of this, make sure that there is sufficient space around the aircraft when you tow with the nose gear.

Subtask 07-40-01-869-002-A01

E. Close-up

(1) Visual Inspection

(a) When you have completed the towing operation, make sure that the nose wheels are aligned with the aircraft centerline.

(2) Aircraft Configuration

(a) Put the wheel chocks in position in front of and behind the wheels.

(b) On the panel 117VU, set the PARKING BRK control switch to ON.

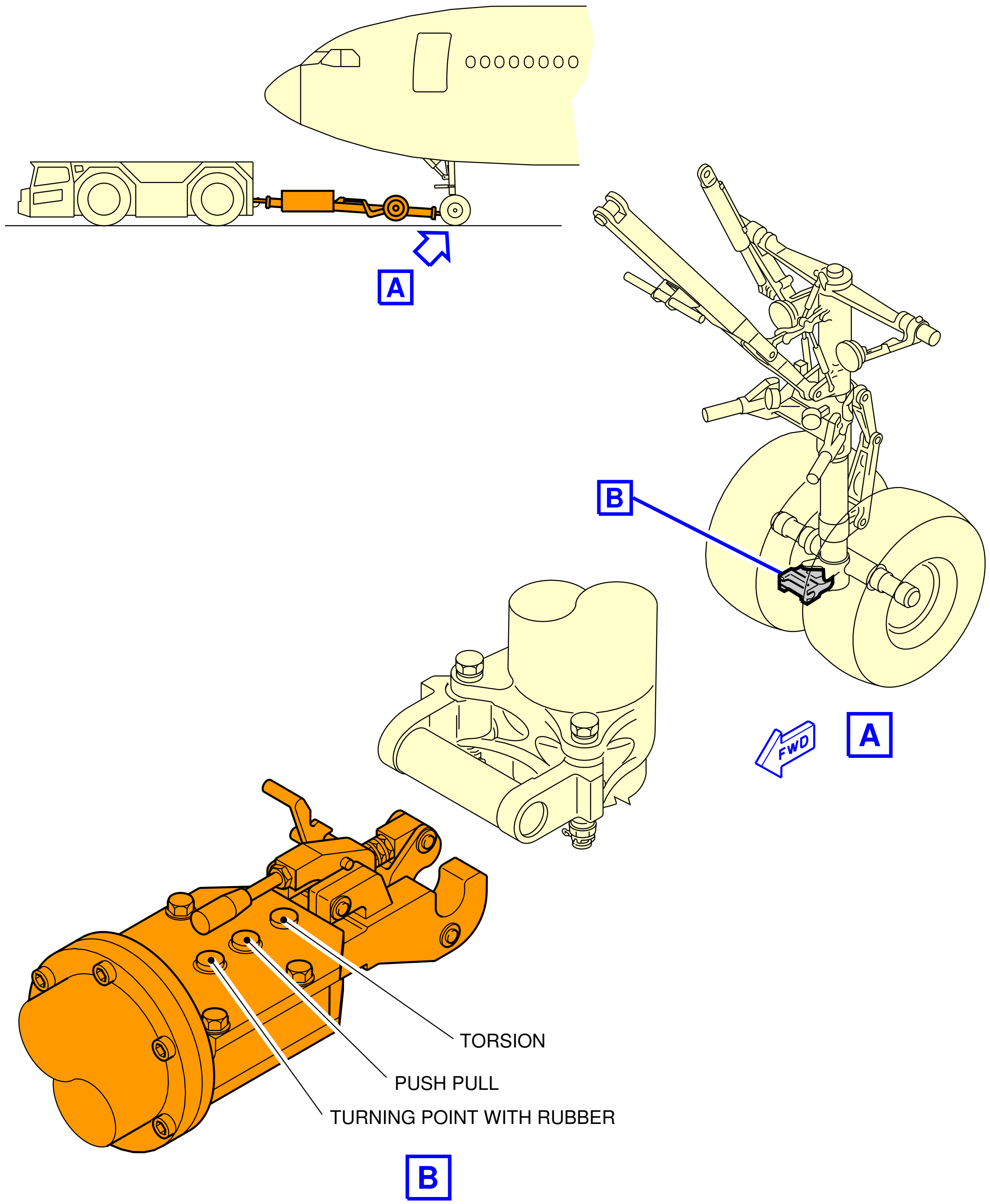
(c) On the panel 312VU, on the triple pressure indicator:
Make sure that the pointer of the top gauge (ACCU PRESS) is in the green range 3000 psi (206.8427 bar).
If necessary, pressurize the Blue Hydraulic System, see AMM 29-00-00-863-802.

(3) Removal of the Towbar

(a) Remove the towbar from the fitting of the NLG.

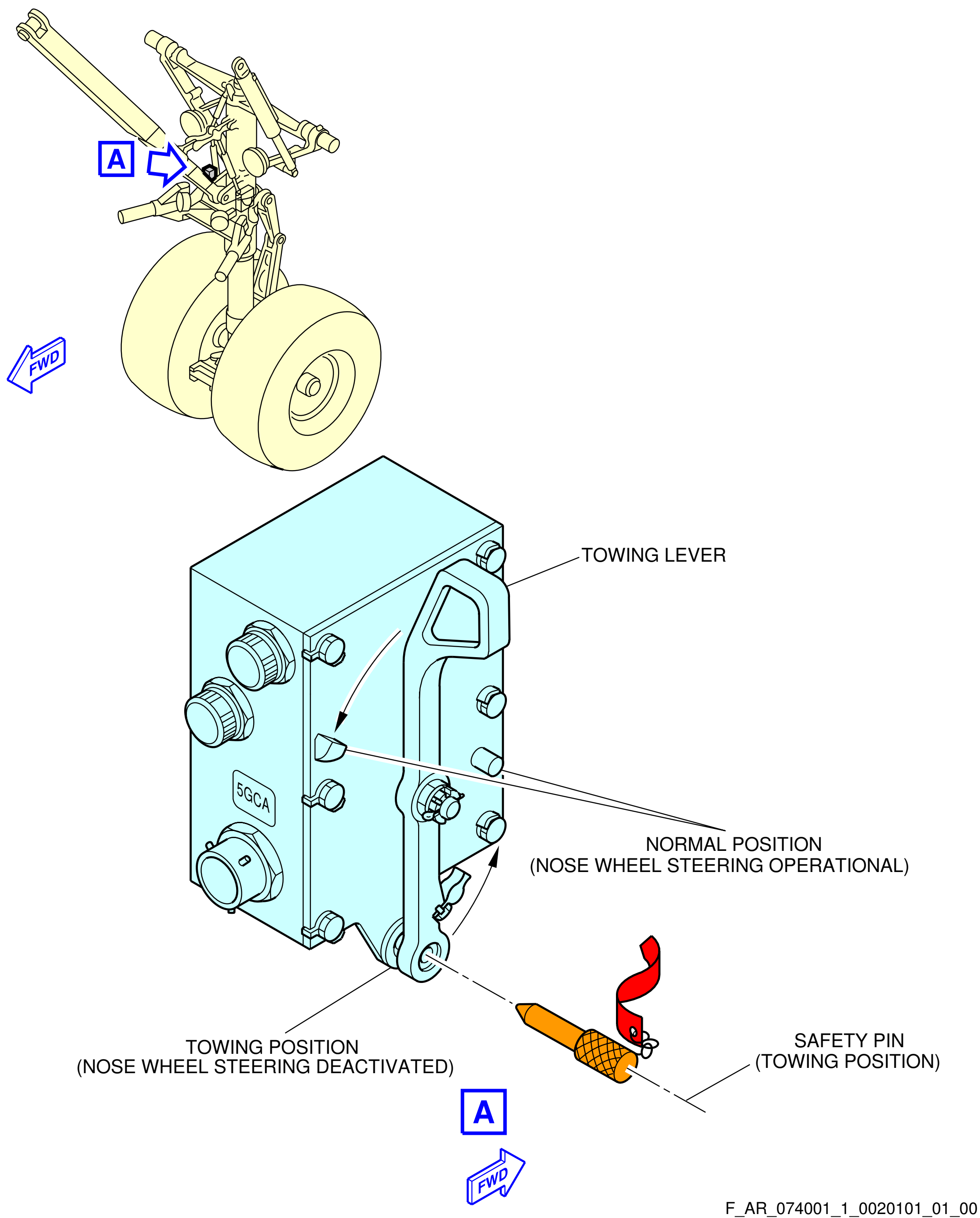
(b) On the Nose Wheel Steering deactivation electrical-box 5GC (see FIGURE 07-40-01-991-002-A).
- Remove the D23156000 PIN-SAFETY.
- Set the ground-towing control lever in the normal position.

**ON A/C A330-200 A330-300



Towing from the NLG
Towing Attachment
FIGURE-07-40-01-991-001-A01

**ON A/C A330-200 A330-300



Towing from the NLG
N/W-Steering Deactivation Electrical-Box 5GC
FIGURE-07-40-01-991-002-A01

****ON A/C A330-200 A330-300**

TASK 07-40-01-584-802-A01

Towing from the NLG with a Towbarless Tractor

1. General
   This procedure gives details to push the aircraft rearward or to tow the aircraft forward using a towbarless tractor on the NLG.

2. Inspections
   - Make sure that the safety devices are installed on the landing gear, see TASK 02-30-01-481-802-A02.
   - Make sure that the aircraft is stable, see AMM 05-57-00-200-801 or TASK 04-20-00-588-801-A01.
   - Make sure that the engine cowl are closed.
   - Make sure that the H-dimension of the NLG is not more than 310 mm (12.20 in). See 07-40-04.

3. Job Setup References
   For towing limits, see 07-40-04.

4. Job Set-up Information

   A. Fixtures, Tools, Test and Support Equipment

REFERENCE	DESIGNATION
D23156000	PIN-SAFETY

Fixtures, Tools, Test and Support Equipment

TABLE 1

   B. Referenced Information

REFERENCE	DESIGNATION
TASK 02-30-01-481-802-A02	TASK 02-30-01-481-802-A02-Installation of the Safety Devices on Landing Gears
TASK 04-20-00-588-801-A01	TASK 04-20-00-588-801-A01-Stabilizing the Aircraft
TASK 07-40-01-584-801-A01	TASK 07-40-01-584-801-A01-Towing from the NLG with a Towbar
07-40-04	07-40-04-TOWING LOAD LIMITS
AMM 05-57-00-200-801	
AMM 31-60-00-860-801	
AMM 29-00-00-863-802	

Referenced Information

TABLE 2

5. Procedure

WARNING : WHEN YOU TOW THE AIRCRAFT WITH A TOWBARLESS TRACTOR, THE PARKING BRAKE OR THE BRAKE PEDALS SHALL ONLY BE USED IN CASE OF EMERGENCY. IF YOU APLLY THE PARKING BRAKE OR THE BRAKE PEDALS, YOU CAN CAUSE OVERLOAD TO THE NLG, DAMAGE TO THE TOWBARLESS TRACTOR AND INJURY TO THE PERSONEL. IF THIS OCCURS, YOU MUST CONTACT AIRBUS.

CAUTION : WHEN YOU USE A TOWBARLESS TRACTOR, MAKE SURE THAT YOU OBEY FULLY ALL THE INSTRUCTIONS IN THIS PROCEDURE. IF YOU DO NOT, THE TRACTOR CAN CAUSE IMPORTANT SCRAPING OR OTHER DAMAGE TO THE NLG AND TO THE AIRFRAME STRUCTURE AROUND THE NLG.

CAUTION : BEFORE YOU TOW THE AIRCRAFT WITH A TOWBARLESS TRACTOR, MAKE SURE THAT THE AIRCRAFT OR THE TRACTOR HAS AN OVERSTEERING WARNING SYSTEM.

Subtask 07-40-01-500-003-A01

A. Preparation

(1) If possible, do an EIS start procedure, see AMM 31-60-00-860-801.

(2) On the Nose Wheel Steering deactivation electrical-box 5GC (see TASK 07-40-01-584-801-A01):

(a) Set the ground-towing control lever to the towing position.

(b) Install the D23156000 PIN-SAFETY.

Subtask 07-40-01-500-004-A01

B. Installation of the Towbarless Tractor

CAUTION : AIRBUS STRONGLY RECOMMENDS THAT THE OPERATORS OF TOWBARLESS TRACTORS CAREFULLY ALIGNS THE CLAMPING DEVICE OF THE TRACTOR WITH THE NOSE LANDING GEAR AXIS. THE GAP BETWEEN THE CRADLE AND THE TORQUE-LINK IS VERY SMALL AND A MISALIGNMENT CAN CAUSE DAMAGE TO THE TORQUE-LINK PIN. A SIMPLE ALIGNMENT DEVICE ON THE TRACTOR (MARKING, METAL INDICATOR, ETC. SUPPLIED BY THE MANUFACTURER OF THE TOWBARLESS TRACTOR OR MANUFACTURED LOCALLY) CAN HELP THE DRIVER.

(1) There are special approval procedures for towbarless tractors. Before towing, make sure that the towbarless is approved for the towing of this aircraft. For more information on the towbarless tractors, see the SIL 09-002.

(2) Set the aircraft type on the towbarless tractor, if necessary.

(3) Remove the wheel chocks from the nose landing gear wheels.

(4) Align the clamping device of the tractor with the NLG axis.

(5) Lock on and lift the NLG.

(6) Make sure that the nose landing gear is correctly on the center of the tractor platform and cannot be disengaged from the tractor.

(7) Remove the wheel chocks from the main landing gear wheels.

Subtask 07-40-01-869-003-A01

C. Aircraft Configuration

(1) On the panel 312VU, on the triple pressure indicator:
- Make sure that the pointer of the top gauge (ACCU PRESS) is in the green range 3000 psi (206.8427 bar).
- If necessary, pressurize the blue hydraulic system (see AMM 29-00-00-863-802).

(2) On the panel 117VU, set the PARKING-BRK control-switch to OFF.

(3) Pressurize the blue hydraulic system during the towing operation (see AMM 29-00-00-863-802).

Subtask 07-40-01-584-002-A01

D. Towing

WARNING : DURING TOWING / TAXIING OPERATION (LOW-SPEED OPERATION INCLUDED), EACH PERSON IN THE AIRCRAFT MUST BE IN A SEAT AND THE SEAT BELT MUST BE FASTENED. IF THE SEAT BELT IS NOT FASTENED, THERE IS A RISK OF INJURY IF THE AIRCRAFT STOPS SUDDENLY.

CAUTION : PUT THE PARKING BRAKE CONTROL SWITCH IN THE OFF POSITION BEFORE YOU TOW OR PUSH BACK THE AIRCRAFT. THIS IS TO PREVENT HIGH LOADS WHICH CAN CAUSE DAMAGE TO THE NOSE LANDING GEAR.

(1) Tow slowly and smoothly.
During the towing operations, put:
- one person in the cockpit to operate the brakes if necessary,
- two persons to monitor the wing tips.

NOTE : The shock absorber reaction can cause the aircraft to move forward and rearward when you stop the wheels. Because of this, make sure that there is sufficient space around the aircraft when you tow with the nose gear.

Subtask 07-40-01-869-004-A01

E. Close-up

(1) Visual Inspection

(a) When you have completed the towing operation, make sure that the nose wheels are aligned with the aircraft centerline.

(2) Aircraft Configuration

(a) On the panel 117VU, set the PARKING-BRK control switch to ON.

(b) On the panel 312VU, on the triple pressure indicator:
- Make sure that the pointer of the top gauge (ACCU PRESS) is in the green range 3000 psi (206.8427 bar).
- If necessary, pressurize the blue hydraulic system, see AMM 29-00-00-863-802.

(3) Removal of the Towbarless Tractor.

(a) Remove the NLG from the towbarless tractor.

(b) Put the wheel chocks in position in front of and behind the nose landing gear wheels.

(c) Put the wheel chocks in position in front of and behind the main landing gear wheels.

(d) On the Nose Wheel Steering deactivation electrical-box 5GC (see TASK 07-40-01-584-801-A01):
- Remove the D23156000 PIN-SAFETY
- Set the ground-towing control lever in the normal position.

07-40-02 TOWING FROM THE MAIN LANDING GEAR

****ON A/C A330-200 A330-300**

TASK 07-40-02-584-801-A01

Towing from the Main Landing Gear

1. General
   This procedure gives details to tow the aircraft forward or rearward from the MLG.

2. Inspections
   - Make sure that the safety devices are installed on the landing gears, see TASK 02-30-01-481-802-A02.
   - Make sure that the aircraft is stable, see TASK 04-20-00-588-801-A01 or AMM 05-57-00PB200.
   - Make sure that the engine cowls are closed.
   - Make sure that the ground is hard. If necessary, put down the applicable surface equipment: movable taxiway plates, see 07-20-00.
   - Make sure that the H-dimension of the NLG is not more than 310 mm (12.20 in). See 07-40-04.
   - Only try to turn if the ground conditions let you.
   - Do a detail visual inspection of the towing cables and attachments before you do this procedure.

3. Job Setup References
   For towing limits, see 07-40-04.

4. Job Set-up Information

   A. Fixtures, Tools, Test and Support Equipment

REFERENCE	DESIGNATION
D23156000	PIN-SAFETY
98F09101002000	CABLE, TOWING-MLG
98F09103500000	CABLE, TOWING-MLG

Fixtures, Tools, Test and Support Equipment

TABLE 1

   B. Referenced Information

REFERENCE	DESIGNATION
TASK 02-30-01-481-802-A02	TASK 02-30-01-481-802-A02-Installation of the Safety Devices on Landing Gears
TASK 04-20-00-588-801-A01	TASK 04-20-00-588-801-A01-Stabilizing the Aircraft
TASK 07-40-01-584-801-A01	TASK 07-40-01-584-801-A01-Towing from the NLG with a Towbar
07-40-04	07-40-04-TOWING LOAD LIMITS
07-20-00	07-20-00-PREPARING A ROADWAY
AMM 05-57-00PB200	
AMM 31-60-00-860-801	

REFERENCE	DESIGNATION
AMM 29-00-00-863-802	
FIGURE 07-40-02-991-001-A	FIGURE 07-40-02-991-001-A-Towing from the MLG

Referenced Information

TABLE 2

5. Procedure

Subtask 07-40-02-500-001-A01

A. Preparation

(1) If possible do an EIS start procedure, see AMM 31-60-00-860-801.

(2) On the Nose Wheel Steering deactivation electrical box 5GC, see TASK 07-40-01-584-801-A01.

(a) Set the ground-towing control lever to the towing position.

(b) Install the D23156000 PIN-SAFETY.

Subtask 07-40-02-500-002-A01

B. Installation of the Towing Cable

WARNING : MAKE SURE THAT THE GROUND SAFETY-LOCKS ARE CORRECTLY INSTALLED ON THE LANDING GEAR. THIS PREVENTS UNWANTED MOVEMENT OF THE LANDING GEAR.

WARNING : MAKE SURE THAT NO PERSONS ARE NEAR THE TOWING CABLES WHEN THE TRACTOR APPLIES TENSION TO THE CABLES. DEATH OR INJURY CAN OCCUR IF A CABLE BREAKS.

(1) Install the towing fitting on the applicable position (FWD or AFT), see FIGURE 07-40-02-991-001-A.

(2) Install the 98F09101002000 CABLE, TOWING-MLG or 98F09103500000 CABLE, TOWING-MLG on the towing fitting of the MLG, see FIGURE 07-40-02-991-001-A.

(3) Connect the 98F09101002000 CABLE, TOWING-MLG or 98F09103500000 CABLE, TOWING-MLG to the tractor.

Subtask 07-40-02-869-001-A01

C. Aircraft Configuration

(1) On the panel 312VU, on the triple pressure indicator:

- Make sure that the pointer of the top gauge (ACCU PRESS) is in the green range 3000 psi (206.8427 bar).
- If necessary, pressurize the blue hydraulic system, see AMM 29-00-00-863-802.

(2) On the panel 117VU, set the PARKING BRK control switch to OFF.

Subtask 07-40-02-584-001-A01

D. Towing

WARNING : DURING TOWING / TAXIING OPERATION (LOW-SPEED OPERATION INCLUDED), EACH PERSON IN THE AIRCRAFT MUST BE IN A SEAT AND THE SEAT BELT MUST BE FASTENED. IF THE SEAT BELT IS NOT FASTENED, THERE IS A RISK OF INJURY IF THE AIRCRAFT STOPS SUDDENLY.

WARNING : MAKE SURE THAT NO PERSONS ARE NEAR THE TOWING CABLES WHEN THE TRACTOR APPLIES TENSION TO THE CABLES. DEATH OR INJURY CAN OCCUR IF A CABLE BREAKS.

CAUTION : PUT THE PARKING BRAKE CONTROL SWITCH IN THE OFF POSITION BEFORE YOU TOW OR PUSH BACK THE AIRCRAFT. THIS IS TO PREVENT HIGH LOADS WHICH CAN CAUSE DAMAGE TO THE NOSE LANDING GEAR.

(1) Tow slowly and smoothly.

(2) During towing operations put:
- one person in the cockpit to operate the brakes if necessary,
- two persons to monitor the wing tips.

WARNING : DO NOT USE A MANUAL NOSE WHEEL STEERING BAR DURING TOWING FROM THE FRONT BECAUSE THE TOWING CABLES WILL BE NEAR THE PERSON AT THE STEERING BAR. DEATH OR INJURY CAN OCCUR IF A TOWING CABLE BREAKS.

(3) If possible, keep the tractor aligned with the aircraft centerline.

Subtask 07-40-02-869-002-A01

E. Close-Up

(1) Visual Inspection

(a) When you have completed the towing operation, make sure that the nose wheels are aligned with the aircraft centerline.

(2) Aircraft Configuration

(a) Put the wheel chocks in position in front of and behind the wheels.

(b) On the panel 117VU, set the PARKING BRK control switch to ON.

(c) On the panel 312VU, on the triple pressure indicator:
- Make sure that the pointer of the top gauge (ACCU PRESS) is in the green range 3000 psi (206.8427 bar).

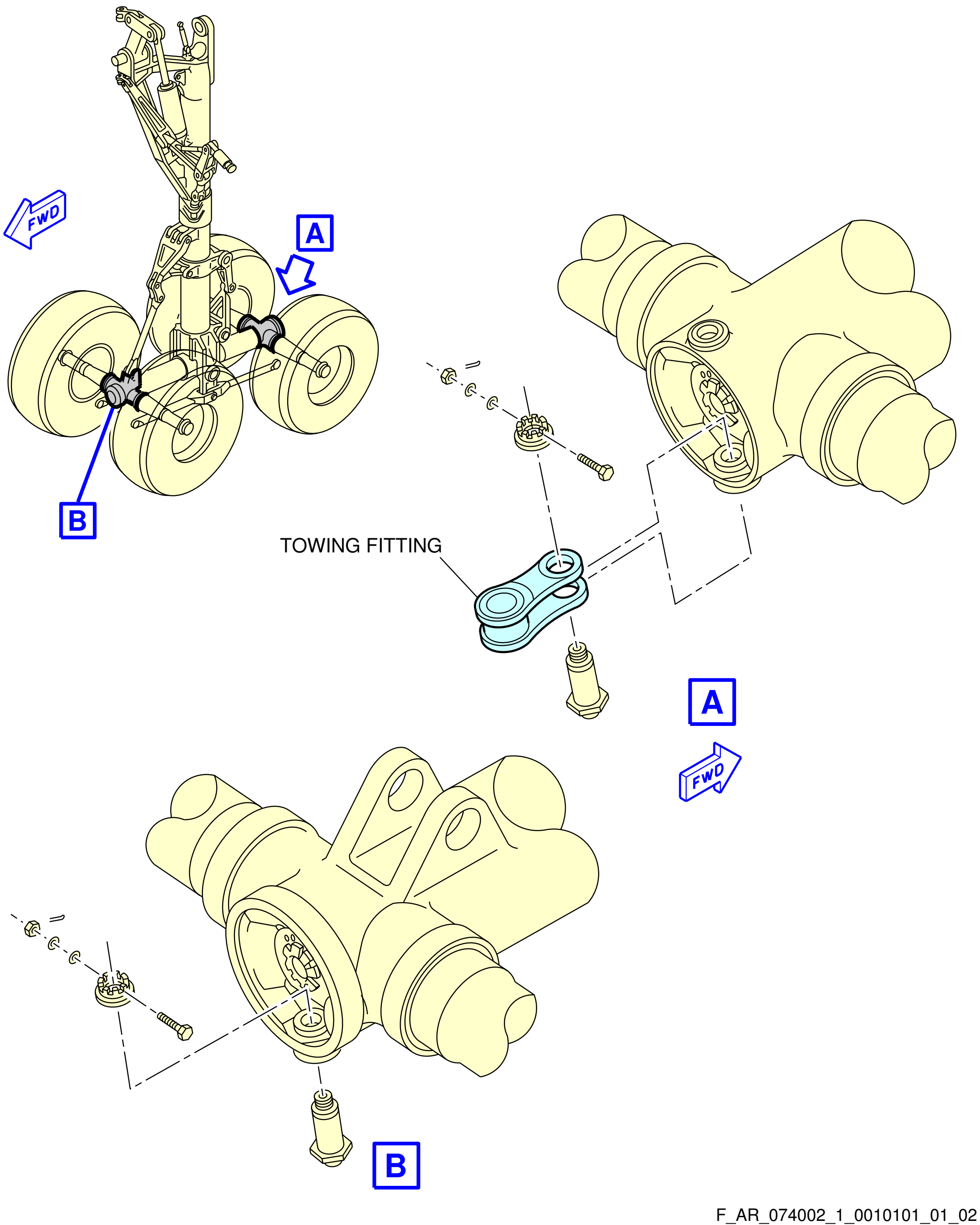
- If necessary, pressurize the blue hydraulic system, see AMM 29-00-00-863-802.

(3) Removal of the tooling

(a) Disconnect and remove the towing cable.

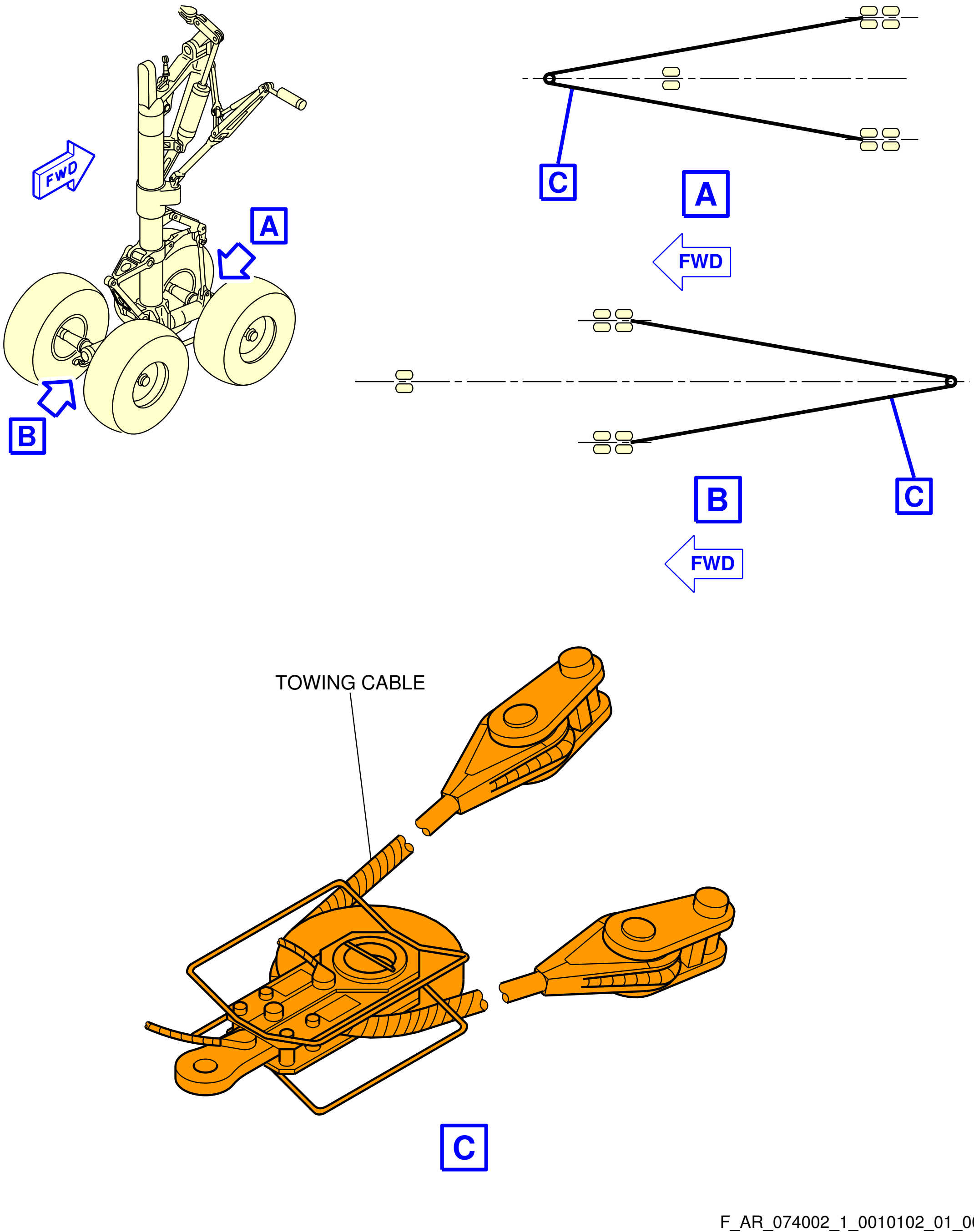
(b) On the Nose Wheel Steering deactivation electrical-box 5GC (see TASK 07-40-01-584-801-A01):
- Remove the D23156000 PIN-SAFETY.
- Set the ground-towing control lever in the normal position.

**ON A/C A330-200 A330-300



Towing from the MLG
Towing Fitting (Sheet 1 of 2)
FIGURE-07-40-02-991-001-A01

**ON A/C A330-200 A330-300



Towing from the MLG
Installation of Towing Cable (Sheet 2 of 2)
FIGURE-07-40-02-991-001-A01

07-40-03 TOWING WITH DEFLATED TIRES

****ON A/C A330-200 A330-300**

TASK 07-40-03-584-801-A01

Towing with Deflated Tires

1. General
   This procedure gives details and limitations to tow the aircraft when one or more tires are deflated on one or more landing gears.
2. Inspections
   Not applicable.
3. Job Setup References
   The steering angle must be kept to a limit when you tow the aircraft with one or more tires deflated on one or more landing gears.
4. Job Set-up Information
   A. Referenced Information

REFERENCE	DESIGNATION
TASK 07-40-01-584-801-A01	TASK 07-40-01-584-801-A01-Towing from the NLG with a Towbar
TASK 07-40-01-584-802-A01	TASK 07-40-01-584-802-A01-Towing from the NLG with a Towbarless Tractor

Referenced Information

TABLE 1

5. Procedure

   Subtask 07-40-03-584-001-A01

   A. Towing by Nose Gear
      (1) One tire is deflated on one or more gears (a maximum of 4 deflated tires). Tow by the nose gear only, see TASK 07-40-01-584-801-A01.
         (a) Both nose gear tires inflated.
            - The maximum permitted lateral angle of the towbar is plus or minus 40 degrees.
         (b) One nose gear tire deflated.
            - The maximum permitted lateral angle of the towbar is plus or minus 10 degrees.
      (2) Two tires are deflated (one per axle) on any one main gear. Tow by the nose gear only, see TASK 07-40-01-584-801-A01.
         (a) Both nose gear inflated.
            - The maximum deflection of the towbar is plus or minus 10 degrees.

Subtask 07-40-03-584-002-A01

B. Towing by Main Gear

(1) Two tires are deflated on the same axle or three tires are deflated on the main gear.
- Tow by the main gear only, see TASK 07-40-01-584-802-A01.

(a) Both nose gear tires inflated.
- The maximum permitted steering angle is plus or minus 50 degrees.

(2) Four tires are deflated on the same main gear.
- Tow by the main gear only, see TASK 07-40-01-584-802-A01.

(a) Both nose gear tires inflated.
- No deflection of the towbar is permitted.
- The towing speed must not be more than 5 km/h (3 mph).

07-40-04 TOWING LOAD LIMITS

****ON A/C A330-200 A330-300**

DESC 07-40-04-001-A01

Load and Angle Limits

1. Towing

WARNING : OBEY THE SAFETY PRECAUTIONS DURING TOWING OR MOVEMENT OF THE AIRCRAFT. MAKE SURE THAT THE PATH OF THE AIRCRAFT IS CLEAR. MAKE SURE THAT NO PERSONS SIT OR STAND ON THE TOW BAR OR USE THE TRACTOR AS TRANSPORT, THIS IS TO PREVENT THE RISK OF INJURY.

WARNING : DURING TOWING / TAXIING OPERATION (LOW-SPEED OPERATION INCLUDED), EACH PERSON IN THE AIRCRAFT MUST BE IN A SEAT AND THE SEAT BELT MUST BE FASTENED. IF THE SEAT BELT IS NOT FASTENED, THERE IS A RISK OF INJURY IF THE AIRCRAFT STOPS SUDDENLY.

CAUTION : DO NOT TOW OR MOVE THE AIRCRAFT ON THE GROUND IF THE ENGINE COWLS ARE OPEN.
MOVEMENT OF THE AIRCRAFT WITH THE COWLS OPEN CAN CAUSE DAMAGE TO THE COWLS AND THE NACELLE STRUCTURE.

It is recommended that you use a towbar with a damping system.

A. You can use the NLG towbar fitting to tow or push the aircraft:
   - With maximum weight,
   - With the engines between zero and idle.

B. You can use the MLG attachments to tow the aircraft:
   - With the engines stopped,
   - When it is bogged.

C. Do not tow the aircraft if the dimension H is more than 310 mm (12.2047 in), (see FIGURE 07-40-04-991-001-A). If you do so, you can cause damage to the cams that make the nose gear wheels go back to the center position.

D. Keep a minimum of 3 m (9.84 ft) separation from the nose wheels, towbar and tractor while the aircraft moves.

2. Speed Limits
The maximum permitted towing speed changes with the aircraft configuration.

A. Doors closed and locked or removed:

   (1) For a tractor with a towbar, a maximum speed of 25 km/h (15.5 mph) is permitted.

   (2) For a towbarless tractor, a maximum speed of 32 km/h (19.9 mph) is permitted.

B. Passenger/Crew doors fully open and locked and/or cargo doors open in vertical position:

(1) The maximum permitted speed is 10 km/h (6.2 mph).

C. In wind conditions, calculate the permitted towing speed before towing:

(1) Measure the wind speed.

(2) Do a check of aircraft stability, see TBD or AMM 05-57-00-200-801.

(3) Substract measured wind speed from wind speed limit shown on the stability curve. This gives the maximum permitted towing speed.

3. Approximate Towing Loads
See FIGURE 07-40-04-991-002-A.

NOTE : In all the formulas, MTW = Maximum Taxi Weight.

A. When you push the aircraft rearward with the engines at idles, you must add the engine thrust resistance to the towing loads.

NOTE : The engine thrust resistance at ground idle is:
- RR: 1500 daN (for each engine in operation),
- PW: 1275 daN (for each engine in operation),
- GE: 1050 daN (for each engine in operation).

B. Use these coefficients for the friction between the tires of the tow tractor and the ground to calculate the tractor weight:
- Dry concrete or asphalt: 0.80
- Wet asphalt: 0.75
- Wet concrete: 0.57
- Hard snow: 0.20
- Ice: 0.05

Minimum Tractor Weight = 6% MTW / (friction coefficient).

4. Limit Loads and Angles
See FIGURE 07-40-04-991-003-A.

A. In all the towing configurations, the safety pin locks the control lever on electrical-box in the disengaged position.

B. The maximum permitted steering angle on each side of the aircraft centerline is:
- +/- 60 degrees with or without towbar.

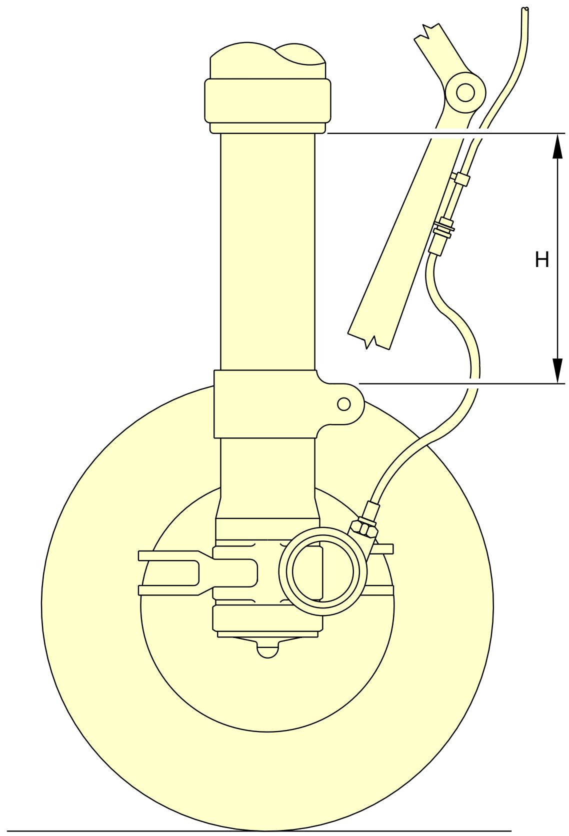
C. During towing, the towing angle must not be more that then angle shown on the FWD NLG doors.

D. Tow the aircraft (slowly and smoothly) with the main landing gear:
- The maximum towing angle in the vertical plane is 5 degrees.
- The NLG gives the limits for the maximum towing angle in the horizontal plane.

E. Use a towbar with:
   - The towing shear pins, calibration 28620 daN (64340.3071 lbf) for the protection of the landing gear against too high loads,
   - The safety shear pin, calibration 3130m.daN (23082.59 lbf.ft) for the protection of the landing gear against too high torsion.

F. Use:
   - The tow special fork fitting and a cable to tow the main landing gear forward or rearward. Attach these special fork fittings to the lugs at each end of the landing gear.
   - The safety shear pin, calibration 51300 daN (115322 lbf) which comes with the two-fitting/cable set.

**ON A/C A330-200 A330-300



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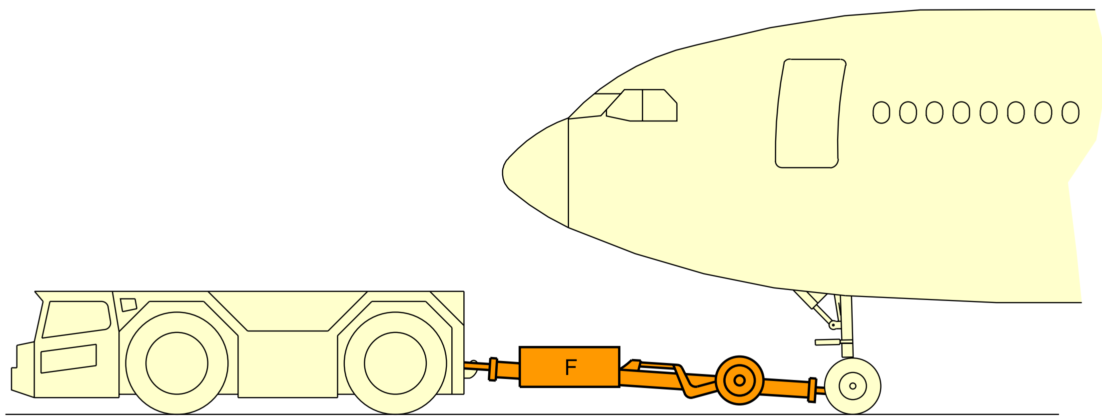
Towing Limits
Maximum Extension of the NLG Shock Absorber
FIGURE-07-40-04-991-001-A01

**ON A/C A330-200 A330-300



TOWING FORCES	
BREAKAWAY	6% MTW
ROLLING	3% MTW
BREAKAWAY ON SLOPE	6% MTW + 1% MTW PER 1% SLOPE
ROLLING ON SLOPE	3% MTW + 1% MTW PER 1% SLOPE

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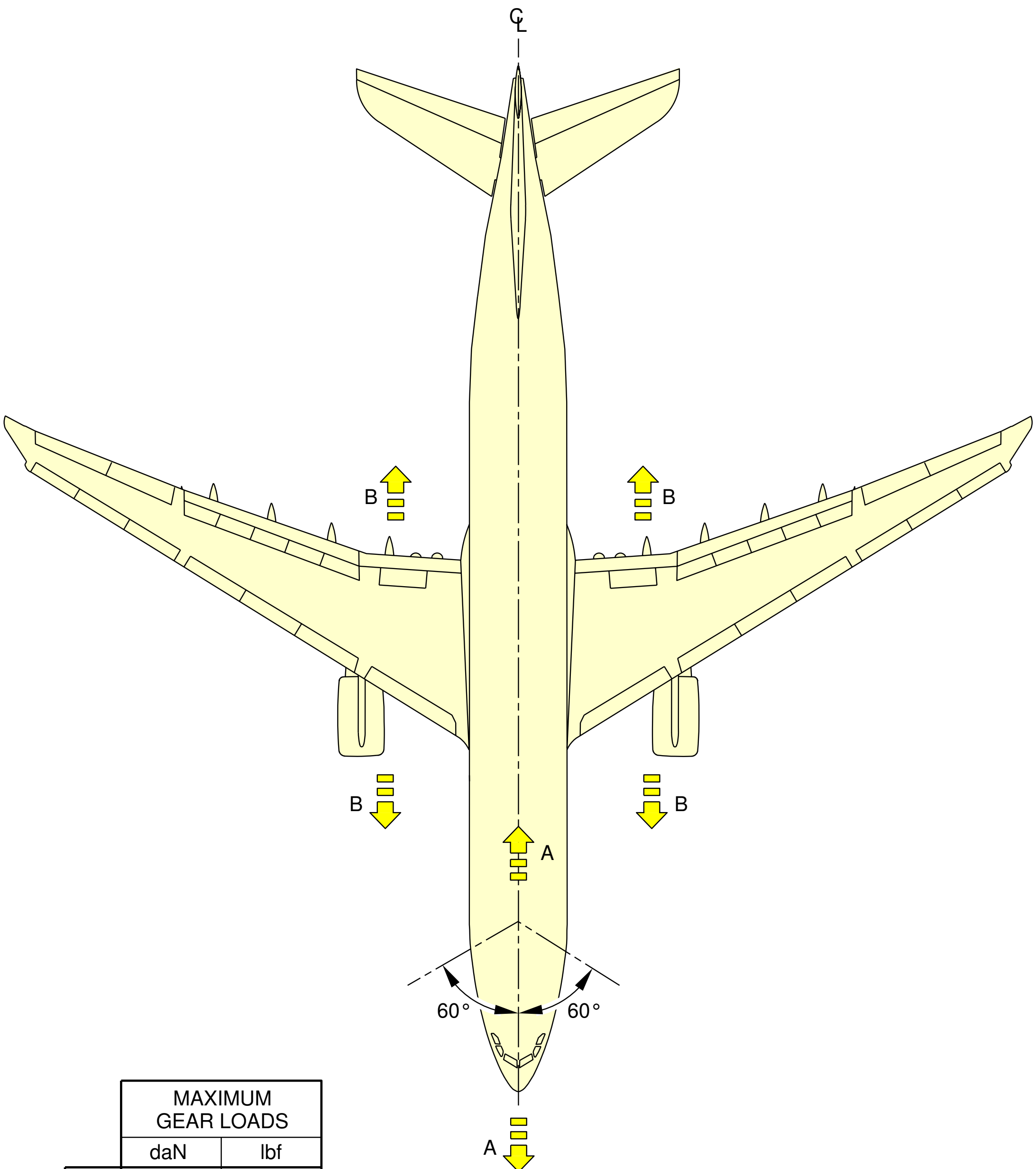
Towing Limits
Towing Forces
FIGURE-07-40-04-991-002-A01

**ON A/C A330-200 A330-300



	MAXIMUM GEAR LOADS	
	daN	lbf
A	28 620	64 340
B	51 300	115 322

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Towing Limits
Towing Loads and Angles
FIGURE-07-40-04-991-003-A01

07-60 MOVING DAMAGED AIRCRAFT

07-60-00 MOVING DAMAGED AIRCRAFT

**ON A/C A330-200 A330-300

DESC 07-60-00-001-A01

General

1. This section describes the moving of aircraft with damaged or missing landing gear.
   If it is possible, the aircraft must always be moved the landing gear supporting the weight of the aircraft.
   Before moving the aircraft, you must verify the structural integrity of the landing gear and the structural attachments in accordance with the landing gear inspection procedure 02-30-01.
   For landing gears that are not correctly extended, see TASK 04-80-20-867-801-A01 for information on the manual extension of the landing gear.
   If any of the landing gear are damaged, you must always try to repair or replace the damaged landing gear. This could include:
   - The repair of the existing landing gear,
   - The installation of a replacement landing gear,
   - The temporary bracing of the landing gear to support the weight of the aircraft.

   The repair or replacement of damaged landing gear is the recommended solution if a replacement landing gear is available and the structural attachments for the landing gear are not damaged.
   If it is not possible to move the aircraft using its landing gears, then you must use a different support system to move the aircraft, see 07-60-03. It may be necessary to use one of the following vehicles or a combination of vehicles to move the aircraft.
   - Flat bed trailers
   - Movable cranes
   - Specialist aircraft recovery transportation systems
   - General purpose trucks
   - Commercial transport equipment.

   Moving the aircraft using aircraft recovery vehicles must be the last method to be used after all other methods have been analyzed. When aircraft recovery transport vehicles are used, secondary damage is possible.

07-60-01 MOVING DAMAGED AIRCRAFT ON TRAILERS

****ON A/C A330-200 A330-300**

DESC 07-60-01-001-A01

Moving Damaged Aircraft on Trailers

1. If the Landing Gear cannot be made serviceable, the use of trailers gives a safe and correct method of supporting the aircraft fuselage and/or the wings.

   WARNING : MAKE SURE THAT THE TRAILERS, AND ALL OTHER EQUIPMENT YOU USE WITH THE TRAILERS, ARE SAFE FOR THE WEIGHT THEY MUST SUPPORT.

   CAUTION : BE CAREFUL WHEN YOU USE SUPPORTS. MAKE SURE THAT THE LOADS ON THE AIRFRAME ARE LESS THAN THE ALLOWABLE LOADS (SKIN LOADING LIMITS) WHEN YOU USE SUPPORTS. THE SUPPORTS APPLY LOADS THAT DO NOT OCCUR IN NORMAL OPERATION.

   CAUTION : SECONDARY DAMAGE CAN OCCUR WHEN YOU USE TRAILERS TO SUPPORT AND MOVE THE AIRCRAFT.

   CAUTION : DO NOT APPLY LOADS TO THE ENGINE NACELLE STRUCTURE BECAUSE SECONDARY DAMAGE WILL OCCUR.

   CAUTION : DO NOT APPLY LOADS TO THE FLAP-TRACK FAIRING STRUCTUE BECAUSE SECONDARY DAMAGE WILL OCCUR

   A. See 06-40-00 for the bearing area under the fuselage and wings.

   B. You must inspect the aircraft structure for damage in the bearing areas. Make sure that the structure is capable of supporting the weight of the aircraft on the trailers.

   C. You can support the forward fuselage on a turntable, this will help to turn the aircraft during the move. If a turntable is used, it must conform to the weight requirements and general aircraft specifications to prevent secondary damage and assist in the removal of the aircraft.

   D. Install supports between the aircraft and the trailer surface. These can be made of timber and must be covered with padded material to avoid damage to the aircraft surfaces. The supports that you use must be able to support the expected loading.

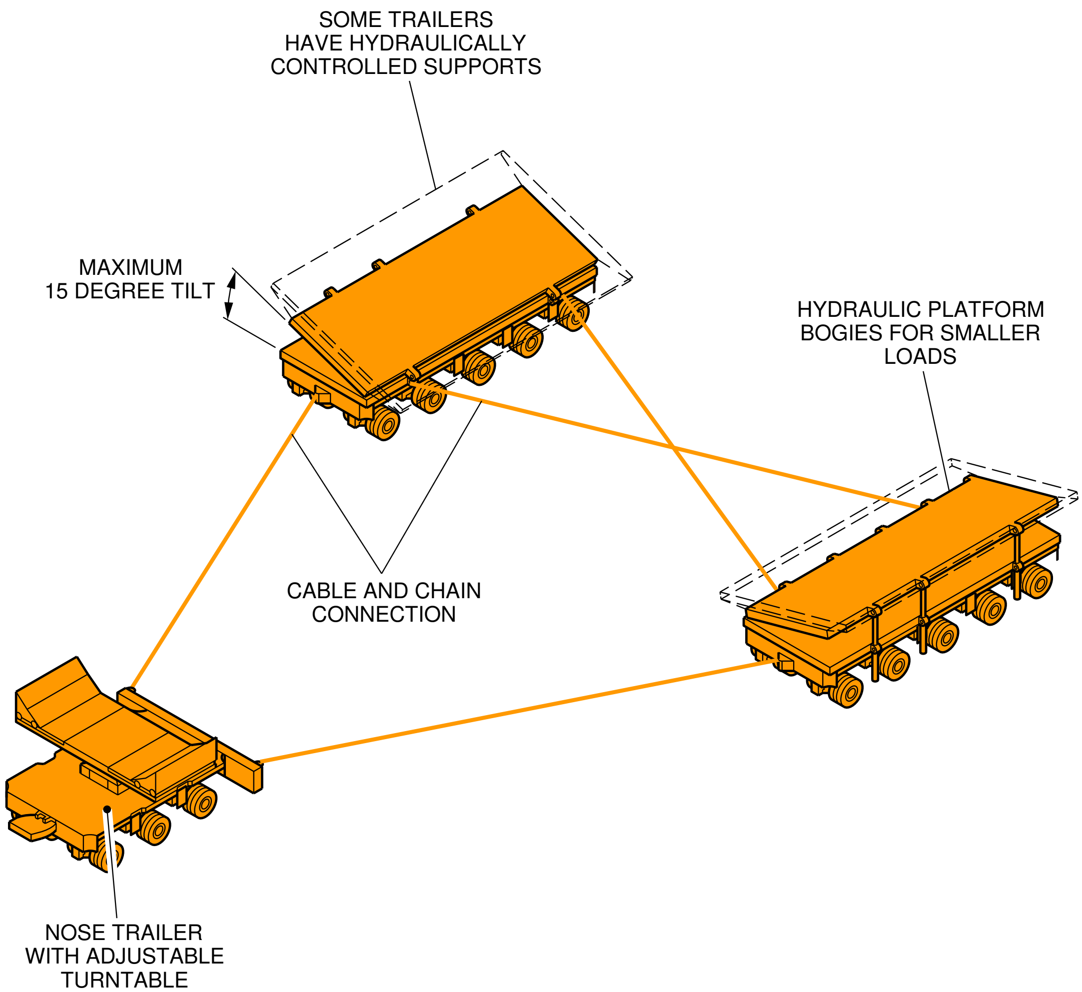
   E. Materials such as mattresses, rubber padding, tires, pneumatic bags and sand bags can be used as padding. It is important that the padding is arranged to follow the contour of the aircraft surfaces, this will helps to spread the loads on the surface and to avoid point loads. Filler foam can be used at the support areas to fill gaps and make a correct contoured support.
   You must not exceed the allowable skin loading limits on the aircraft surfaces, see 06-40-00.

   F. It is important that the supports (timber) and padding remain stable while you move the aircraft. It may also be necessary to tie down the aircraft structure to the trailer to prevent relative movement between the aircraft and the trailer.

G. Some aircraft recovery trailers have hydraulically controlled supports, that conform to the fuselage and wing contours.

H. Monitor the loads during all the moving operation.

**ON A/C A330-200 A330-300



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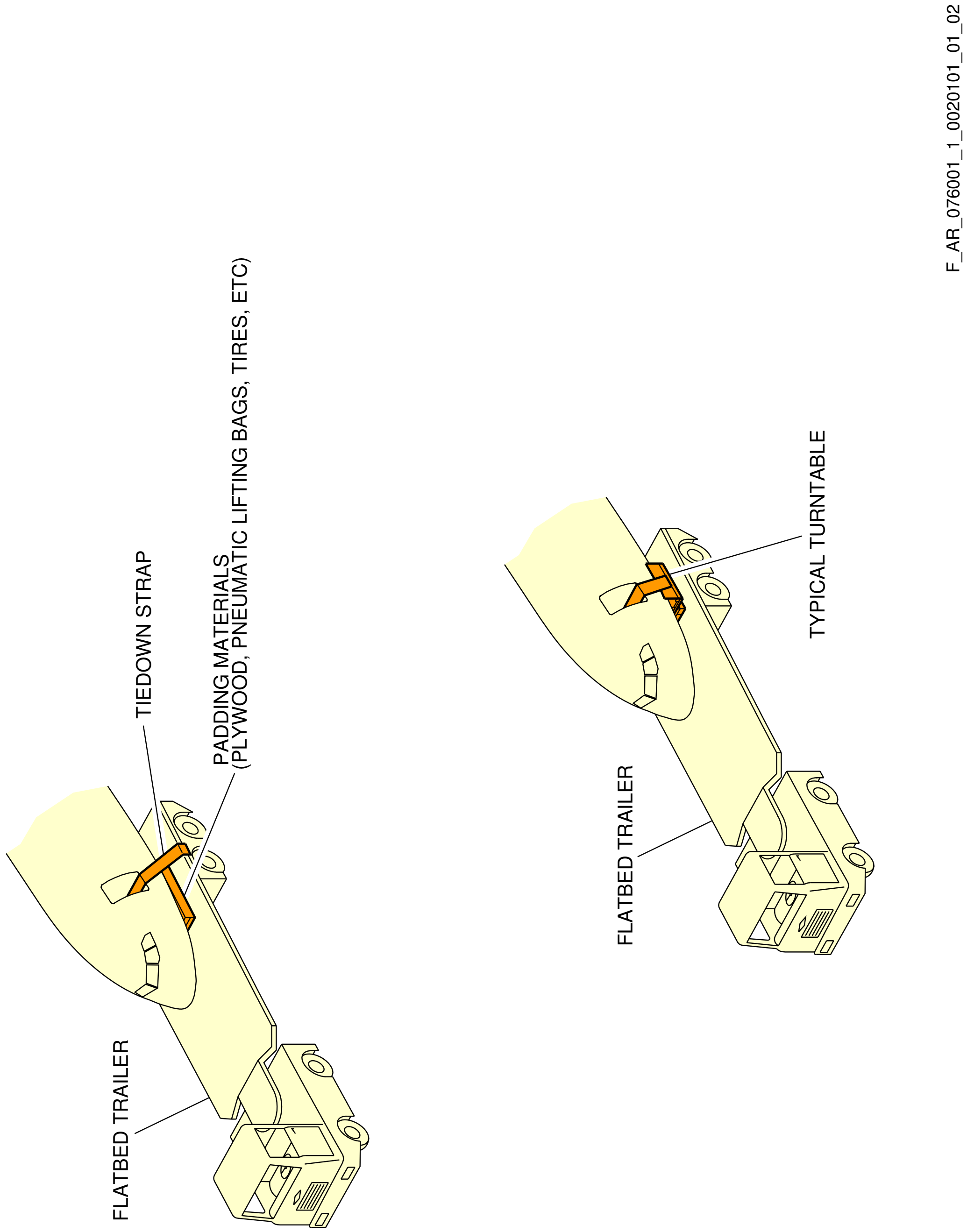
Moving Damaged Aircraft on Trailers
Configuration of Trailers
FIGURE-07-60-01-991-001-A01

**ON A/C A330-200 A330-300



Moving Damaged Aircraft on Trailers
Typical Use of Trailers with Aircraft
FIGURE-07-60-01-991-002-A01

07-60-02 MOVING DAMAGED AIRCRAFT WITH CRANES

****ON A/C A330-200 A330-300**

DESC 07-60-02-001-A01

Moving Damaged Aircraft with Cranes

1. General

   CAUTION : IF THE LOADS APPLIED DURING THE RECOVERY PROCEDURE ARE MORE THAN THE MAXIMUM ALLOWABLE LOADS, YOU MUST CONTACT AIRBUS FOR SPECIFIC INSPECTIONS.

   CAUTION : BE CAREFUL WHEN YOU USE SUPPORTS. MAKE SURE THAT THE LOADS ON THE AIRFRAME ARE LESS THAN THE ALLOWABLE LOADS (SKIN LOADING LIMITS) WHEN YOU USE SUPPORTS. THE SUPPORTS APPLY LOADS THAT DO NOT OCCUR IN NORMAL OPERATION.

   CAUTION : USE ONLY RECOVERY SLINGS AND SPREADER BEAMS SPECIFIED BY AIRBUS. NON-APPROVED LIFTING DEVICES CAN CAUSE SECONDARY DAMAGE TO THE AIRCRAFT.

   CAUTION : MAKE SURE THAT THE CRANE YOU USE CAN LIFT THE ESTIMATED LOAD PLUS THE WEIGHT OF THE LIFTING EQUIPMENT BEFORE YOU START TO LIFT THE AIRCRAFT.

   CAUTION : MAKE SURE THAT THE LOADS ON THE AIRFRAME ARE LESS THAN THE ALLOWABLE LOADS WHEN YOU USE SUPPORTS. THE SUPPORTS APPLY LOADS THAT DO NOT OCCUR IN NORMAL OPERATION.

   The principles outlined in this chapter are provided as a guide to assist an aircraft recovery.
   See 06-50-00 for information on the use of cranes.
   If it is possible, damaged landing gears must be repaired or replaced. This will allow the aircraft to be moved with it's own landing gear supporting the weight of the aircraft.
   If it is not possible to repair or replace the damaged landing gear, an alternative method is to use a mobile crane or a crawler crane to help move the aircraft.

   NOTE : You must analyze other methods of supporting and moving the aircraft before using this method.

   If the aircraft is in this condition, then it is possible to use cranes and sling assembly to level and lift the aircraft. The cranes can then be left in place to support and move the aircraft.
   Roadways must be properly prepared to support the weight of the crane and the aircraft as they are moved, see 07-20-00.

2. Moving the Aircraft with Cranes

   The crane must be positioned close enough to the aircraft and the lifting point, to let the crane use its lifting capacity safely.

A. You must monitor and record the loads on the slings when you use this process.

B. The moveable cranes must begin to move at the same time, and must move steadily at the same speed during the entire aircraft movement operation.

C. The person controlling the operation must be in constant contact with the crane drivers/operators.

D. See 06-50-00 for tooling specification, procedures and limitations to level/lift the aircraft using cranes.

07-60-03 MOVING DAMAGED AIRCRAFT WITH SPECIALIZED EQUIPMENT

****ON A/C A330-200 A330-300**

DESC 07-60-03-001-A01

Moving Damaged Aircraft with Specialized Vehicles

1. Specialized recovery vehicles include sledges and patent trailer systems made by different manufacturers.

   CAUTION : DO NOT APPLY LOADS OUT OF THE ALLOWABLE LIMITS BECAUSE SECONDARY DAMAGE WILL OCCUR

   CAUTION : DO NOT APPLY LOADS TO THE ENGINE NACELLE STRUCTURE BECAUSE SECONDARY DAMAGE WILL OCCUR.

   A. The sledge systems are simple systems that are used to support the aircraft while it is towed on soft ground.

   B. The patent trailer systems are complex systems and can be used to move damaged aircraft that has no serviceable landing gear, see 07-60-01.
      This type of trailer normally:
      - Has hydraulically controlled supports that can conform to the fuselage and wing contours.
      - Has a multi-wheel steering function.
      - Can be linked with beams or cables to other trailers.

POST RECOVERY CORRECTIVE ACTIONS

08-00 POST RECOVERY CORRECTIVE ACTIONS

08-00-00 POST RECOVERY CORRECTIVE ACTIONS

****ON A/C A330-200 A330-300**

DESC 08-00-00-001-A01

General

1. Records
   Airbus recommends that you make records on the full recovery operation.
   These records can help you:
   - To make aircraft maintenance operations easier for the return to service
   - To have a feedback of the recovery operation
   - To have traceability after the recovery.

   The records can include:
   - The aircraft inspection report
   - Results of loads and CG calculations
   - The technique used to level/lift and move the aircraft
   - Loads applied during the recovery operation
   - ...
2. Post Recovery Inspections
   If necessary, do the "Inspection After Leaving Runway or Taxiway", see AMM 05-51-24-200-801.

APPENDIX

09-00 APPENDIX

09-00-00 APPENDIX

****ON A/C A330-200 A330-300**

DESC 09-00-00-001-A01

Introduction

1. This chapter has the structure that follows:
   A. General Information (09-10)
      (1) General charts and formulae for metric and imperial measurement conversion.
      (2) Definitions related to aircraft recovery (glossary).
      (3) General aircraft dimensions (fuselage, wing and horizontal stabilizer stations, frames and ribs, door sizes, ground clearances, ground service connections illustrations, etc.).
   B. Recovery Preparation (09-20)
      (1) Guides or planning charts not related to the aircraft type.
      (2) Possible composition of the recovery team.
   C. Tooling and Equipment (09-30)
      (1) General aircraft recovery materials and equipment.
      (2) Specific aircraft tooling and aircraft recovery kits.
      (3) Aircraft Recovery Kits.
   D. Calculation Worksheets (09-50)
      (1) Weight and balance calculation worksheets.

09-10 GENERAL INFORMATION

09-10-01 UNITS AND CONVERSIONS

****ON A/C A330-200 A330-300**

DESC 09-10-01-002-A01

Units of Measurements

1. This topic gives the ISO and NON-ISO units used in this manual.

Length	meters (m)
	millimeters (mm)
Area	square meters (m^2)
Volume	cubic meters (m^3)
Weight	kilograms (kg)
Density	kilograms per cubic meter (kg/m^3)
	kilograms per liter (kg/l)
Force	Newtons (N)
Moment	Newton-meters (N.m)
	product of weight and length in kilogram-meters (kgm)
Pressure	Pascals (Pa)
	bars (bar)
Velocity	meters per second (m/s)
	kilometers per hour (km/h)
Capacity and Quantity	liters (l)
Temperature	degrees Celsius (°C)
Angle	radians (rad)
	degrees (°)

ISO and Derived Measurement System

TABLE 1

Length	feet (ft)
	inches (in)
Area	square feet (ft^2)
Volume	cubic feet (ft^3)
Weight	pounds (lb)

Density	pounds per cubic foot (lb/ft^3)
	pounds per US gallon (lb/US gal)
Force	pound-force (lbf)
Moment	pound-force feet (lbf.ft)
	product of weight and length in pounds-inches (lb.in)
Pressure	pounds per square inch (psi)
Velocity	feet per seconds (ft/s)
	miles per hour (mph)
Capacity and Quantity	US gallons (US gal)
Temperature	degrees Fahrenheit ($^\circ$F)
Angle	radians (rad)
	degrees ($^\circ$)

US Customary System

TABLE 2

**ON A/C A330-200 A330-300

DESC 09-10-01-001-A01

Conversion Tables

1. This topic gives the conversion values to use for the conversion of units.

	MULTIPLY	BY	TO OBTAIN
Length	Meters (m)	39.37008	Inches (in)
	Meters (m)	3.280840	Feet (ft)
	Millimeters (mm)	0.03937008	Inches (in)
	Millimeters (mm)	0.00328084	Feet (ft)
	Inches (in)	0.0254	Meters (m)
	Inches (in)	25.4	Millimeters (mm)
	Feet (ft)	0.3048	Meters (m)
	Feet (ft)	304.8	Millimeters (mm)
Area	Square meters (m^2)	10.763910	Square feet (ft^2)
	Square feet (ft^2)	0.09290304	Square meters (m^2)
Volume	Cubic meters (m^3)	35.31466	Cubic feet (ft^3)
	Cubic feet (ft^3)	0.02831685	Cubic meters (m^3)
Weight	Kilograms (kg)	2.204622	Pounds (lb)
	Pounds (lb)	0.4535924	Kilograms (kg)
Density	Kilograms per liter (kg/l)	62.42797	Pounds per cubic foot (lb. ft^3)
	Kilograms per liter (kg/l)	8.3456459	Pounds per US gallon (lb/US gal)
	Kilograms per cubic meter (kg/m^3)	0.06242797	Pounds per cubic foot (lb. ft^3)
	Kilograms per cubic meter (kg/m^3)	0.0083457	Pounds per US gallon (lb/US gal)
	Pounds per cubic foot (lb. ft^3)	0.016018463	Kilograms per liter (kg/l)
	Pounds per cubic foot (lb. ft^3)	16.018463	Kilograms per cubic meter (kg/m^3)
	Pounds per US gallon (lb/US gal)	0.119823	Kilograms per liter (kg/l)
	Pounds per US gallon (lb/US gal)	119.8225188	Kilograms per cubic meter (kg/m^3)
Force	Newtons (N)	0.2248089	Pound-forces (lbf)
	Pound-forces (lbf)	4.448222	Newtons (N)
	Newtons (N)	10	Decanewtons (daN)
	Decanewtons (daN)	0.1	Newtons (N)
Moment	Newton-meters (N.m)	0.7375621	Pound-force feet (lbf.ft)
	Pound-force feet (lbf.ft)	1.355818	Newton-meters (N.m)
	Newton-meters (N.m)	10	Decanewton-meters (daN.m)
	Decanewton-meters (daN.m)	0.1	Newton-meters (N.m)

	MULTIPLY	BY	TO OBTAIN
Pressure	Pascals (Pa)	0.0001450377	Pounds per square inch (psi)
	Bars (bar)	14.50377	Pounds per square inch (psi)
	Pounds per square inch (psi)	6894.757	Pascals (Pa)
	Pounds per square inch (psi)	0.06894757	Bars (bar)
Velocity	Meters per second (m/s)	3.2808399	Feet per second (ft/s)
	Meters per second (m/s)	2.2369	Miles per hour (mph)
	Kilometers per hour (km/h)	0.9113	Feet per second (ft/s)
	Kilometers per hour (km/h)	0.6214	Miles per hour (mph)
	Feet per second (ft/s)	0.3048	Meters per second (m/s)
	Feet per second (ft/s)	1.0973	Kilometers per hour (km/h)
	Miles per hour (mph)	0.4470	Meters per second (m/s)
	Miles per hour (mph)	1.6093	Kilometers per hour (km/h)
	Knots (kt)	1.852	Kilometers per hour (km/h)
	Kilometers per hour (km/h)	0.5399568	Knots (kt)
	Knots (kt)	1.150	Miles per hour (mph)
	Miles per hour (mph)	0.86897	Knots (kt)
Capacity Quantity	Liters (l)	0.264172	US gallons (US gal)
	US gallons (US gal)	3.785412	Liters (l)

Conversion Table

TABLE 1

Temperature conversion:

- Temperature conversion from degrees Celsius (˚C) to degrees Fahrenheit (˚F):
  $^\circ F = 1.8 \times\ ^\circ C + 32$
- Temperature conversion from degrees Fahrenheit (˚F) to degrees Celsius (˚C):
  $^\circ C = 0.5555 \times (^\circ F - 32)$

09-10-02 GLOSSARY OF TERMS

ON A/C A330-200 A330-300

DESC 09-10-02-001-A01

Definition of Terms

1. General
   The terms that follow are used in the ARM.

   A. Aircraft Recovery
      An aircraft recovery operation is the action of moving any aircraft that is disabled and unable to move with its power or with the standard use of a correct tow tractor and standard tow bar, but can be economically repairable.
      Examples of aircraft recovery incidents are:
      - One or more landing gears off the hard surface of a runway, taxiway or apron,
      - Aircraft bogged down in mud, snow or sand,
      - One or more landing gears retracted, collapsed, damaged, or missing.

   B. Warnings, Cautions and Notes
      These definition of these are as follow:
      - WARNING: Calls attention to the use of materials, processes, methods, procedures or limits that must be obeyed to prevent injury or death to persons.
      - CAUTION: Calls attention to methods and procedures that must be obeyed to prevent damage to equipment.
      - NOTE: Calls attention to methods that make the job easier or give more information.

2. Weight Terms

   A. Manufacturer Empty Weight (MEW)
      The weight of the structure, power plant, systems, furnishings and other items of equipment, part of a special aircraft configuration, with the fluids in closed systems (e.g. hydraulic fluid). The weights of all operator items are not included.

   B. Operator Items
      These items include:
      - Unusable fuel,
      - Oil for engines, IDG and APU,
      - Water for galleys and lavatories,
      - Chemical fluids for waste tanks,
      - Aircraft documents and tool kits,
      - Passenger seats and life vests,
      - Galley structures and fixed equipment,
      - Catering,
      - Flight and cabin crew and their baggage,
      - Emergency equipment that includes:

Evacuation aids, life rafts, portable oxygen bottles and stowage boxes, extinguishers, megaphones, flash lights, axes, first aid kits, emergency radio beacons, fire resistant gloves and smoke goggles, demonstration kits, life vests for crew and children.

C. Operational Empty Weight (OEW)
The OEW is the sum of the Manufacturer Empty Weight plus the operator items.

D. Dry Operating Weight (DOW)
The DOW is the total weight of an aircraft prepared for a special type of operation without all the usable fuel and traffic load.
It is the sum of the OEW and the special items for the type of flight (e.g. catering, newspapers, pantry equipment etc.).

E. Recoverable Empty Weight (REW)
The REW is the sum of the MEW and the weight of the different operator items which are part of the aircraft. The REW does not include the crew and their baggage or catering equipment and supplies.

F. Net Recoverable Weight (NRW)
The NRW is the REW of the aircraft without the missing or removed aircraft equipment and components. It includes fuel, liquids and cargo remaining on board.
The applicable recovery scenario is based on the NRW.

G. Payload (P/L)
The payload is the weight of the passengers, cargo and baggage.

H. Center of Gravity (CG)
The CG is the point where the aircraft can balance if it hangs at that point. It is the point where the aircraft weight is applied.
If more weight is put in a different point, it causes an unbalancing force which is the "moment". In case of recovery action, the position of CG has to stay within certain predefined limits to ensure aircraft general stability.

J. Reference Chord (RC) or Mean Aerodynamic Chord (MAC)
Usually the position of the CG is defined by a percentage of Reference Chord (%RC).
The Reference Chord is a reference line used in the design of the wing. Its position relative to the wing and fuselage is accurately known. It represents the variation of position of the CG, according to the weight and balance management or other parameters. The normal position of the CG is considered at 25%RC. The position and dimensions of this reference are mentioned in TASK 03-00-00-558-801-A01. These dimensions are specially dedicated to an aircraft type.

K. Maximum Design Landing Weight (MLW)
The MLW is the maximum permitted weight at which the aircraft can land.

L. Maximum Ramp Weight (MRW) / Maximum Taxi Weight (MTW)
The MRW / MTW is the maximum permitted weight for ground maneuvers, that include taxi and run-up fuel.

M. Maximum Takeoff Weight (MTOW)
The MTOW is the maximum permitted weight when the brakes are released for takeoff, or at the start of the takeoff roll.

N. Maximum Zero Fuel Weight (MZFW)
The MZFW is the maximum operating weight without usable fuel.

P. Actual Zero Fuel Weight (AZFW)
The AZFW is the sum of the operational empty weight and payload.
The AZFW must never be more the maximum design zero fuel weight (MZFW).

Q. Engineered Lifting
An engineered lifting is a lifting of the aircraft in controlled conditions, with a predefined process using specific GSE. Before this procedure is started, it is necessary to do:
- An accurate analysis of the requirements
- An accurate engineering planning and a risk/hazard assessment
- A lifting procedure approved by the local authority regulations.

****ON A/C A330-200 A330-300**

DESC 09-10-02-003-A01

Abbreviations

1. List of Abbreviations

   The abbreviations that follow are used in the ARM.

A/C	Aircraft
AC	Aircraft Characteristics for Airport Planning
ACT	Additional Center Tank
AD	Aircraft Datum
AFRP	Aramid Fiber Reinforced Plastic
AMM	Aircraft Maintenance Manual
APU	Auxiliary Power Unit
ARM	Aircraft Recovery Manual
ARWG	Aircraft Recovery Working Group
ATA	Air Transport Association of America
AZFW	Actual Zero Fuel Weight
CBR	California Bearing Ratio
CFRP	Carbon Fiber Reinforced Plastic
CG	Center of Gravity
CL	Center Line
CLG	Center Landing Gear
CLS	Cargo Loading System
CLSM	Cargo Loading System Manual
CRC	Crew Rest Compartment
CTR	Center
DBP	Drawbar Pull
DOW	Dry Operating Weight
ECAM	Electronic Centralized Aircraft Monitoring
EIS	Electronic Instrument System
EWH	External Wiring Harness
FD	Fuselage Datum
FDL	Fuselage Datum Line
FQI	Fuel Quantity Indicator
FR	Frame
FWD	Forward
GFRP	Glass Fiber Reinforced Plastic
GPU	Ground Power Unit

GSE	Ground Service Equipment
IATA	International Air Transport Association
IATP	International Airline Technical Pool
ICAO	International Civil Aviation Organization
IDG	Integrated Drive Generator
INBD	Inboard
INR	Inner
IPC	Illustrated Parts Catalog
L/G	Landing Gear
LDG	Landing
LDMCR	Lower Deck Mobile Crew Rest
LGCIU	Landing Gear Control and Interface Unit
LH	Left Hand
LRE	List of Radioactive and Hazardous Elements Manual
MAC	Mean Aerodynamic Chord
MCDU	Multipurpose Control & Display Unit
MEW	Manufacturer's Empty Weight
MFP	Maintenance Facility Planning Manual
MID	Middle
MLG	Main Landing Gear
MLW	Maximum Design Landing Weight
MMI	Manual Magnetic Indicator
MRW	Maximum Ramp Weight
MSN	Manufacturer's Serial Number
MTOW	Maximum Design Take Off Weight
MTW	Maximum Taxi Weight
MZFW	Maximum Design Zero Fuel Weight
NAS	Navy and Army Standard
NLG	Nose Landing Gear
NRW	Net Recoverable Weight
NWS	Nose Wheel Steering
OEW	Operating Empty Weight
OUTBD	Outboard
P/BSW	Push Button Switch
P/L	Payload
PAX	Passenger
PSU	Passenger Service Unit

RC	Reference Chord
RCT	Rear Center Tank
REW	Recoverable Empty Weight
RH	Right Hand
SRM	Structural Repair Manual
STA	Station
STGR	Stringer
T	Trim
TBD	To Be Define / Determined
TBIL	To Be Issued Later
TEM	Illustrated Tool and Equipment Manual
THS	Trimmable Horizontal Stabilizer
TK	Tank
TPIS	Tire Pressure Indicating System
ULD	Unit Load Device
W&B	Weight and Balance
WBM	Weight and Balance Manual
XFR	Transfer

List of Abbreviations

TABLE 1

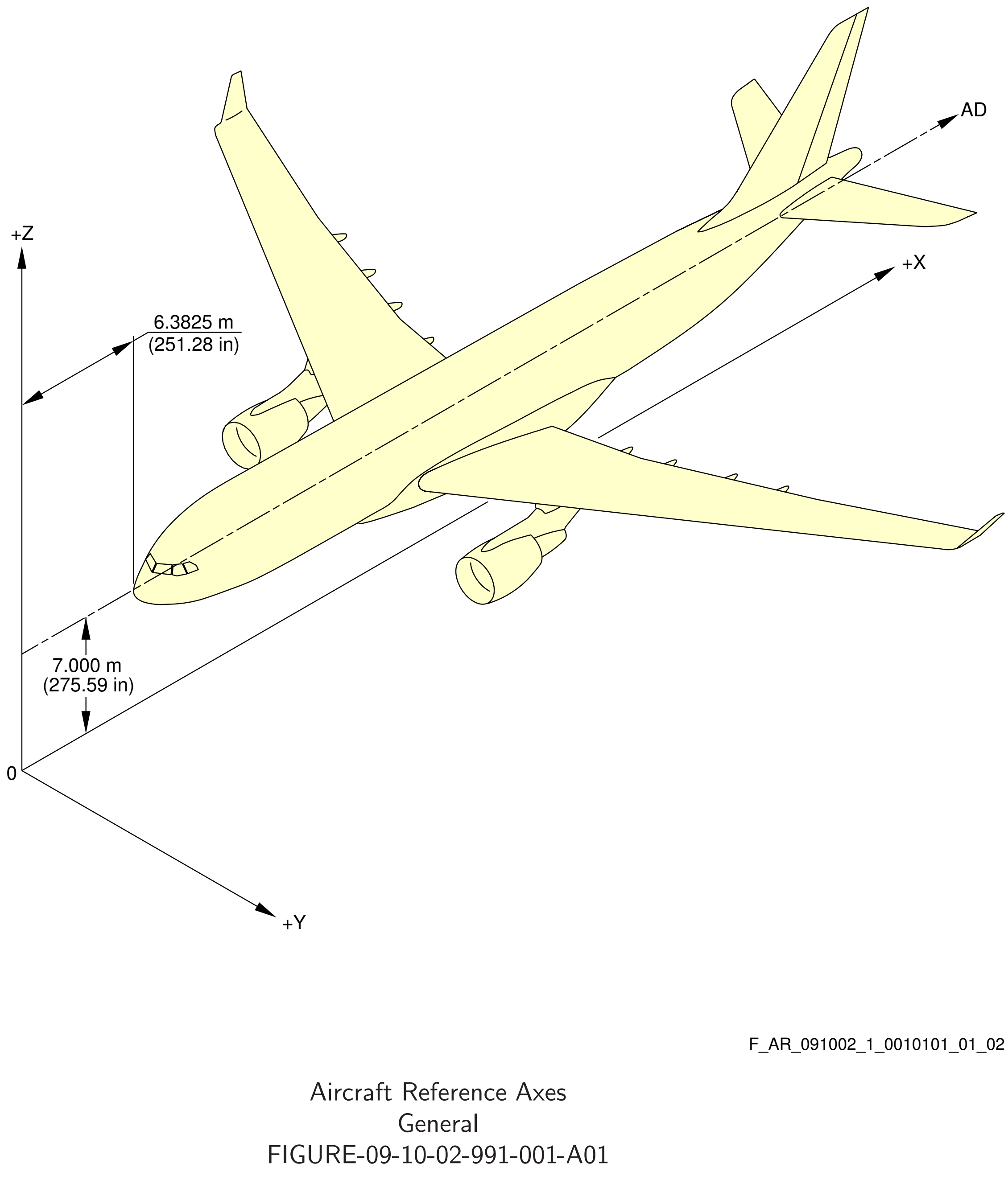
****ON A/C A330-200 A330-300**

DESC 09-10-02-002-A01

Aircraft Reference Axes

1. Definitions
   See FIGURE 09-10-02-991-001-A
   A. AD (Aircraft Datum)
      Vertical plane (equation Y=0). It is shown as a line on XY and YZ drawings.
   B. FD (Fuselage Datum)
      Horizontal plane (equation Z=0). It is shown as a line (FDL) on XZ and YZ drawings.
   C. Fuselage Datum Line (FDL)
      View of FD plan on 2D drawings (XZ and YZ planes).
   D. Center Line (C/L)
      Intersection of AD and FD planes.
   E. H-arm
      Horizontal arm from X=0 in length unit.
   F. Y-arm
      Lateral arm Y=0 in length unit.
   G. Z-arm
      Vertical arm Z=0 in length unit.

**ON A/C A330-200 A330-300



Aircraft Reference Axes
General
FIGURE-09-10-02-991-001-A01

09-10-03 AIRCRAFT DIMENSIONS

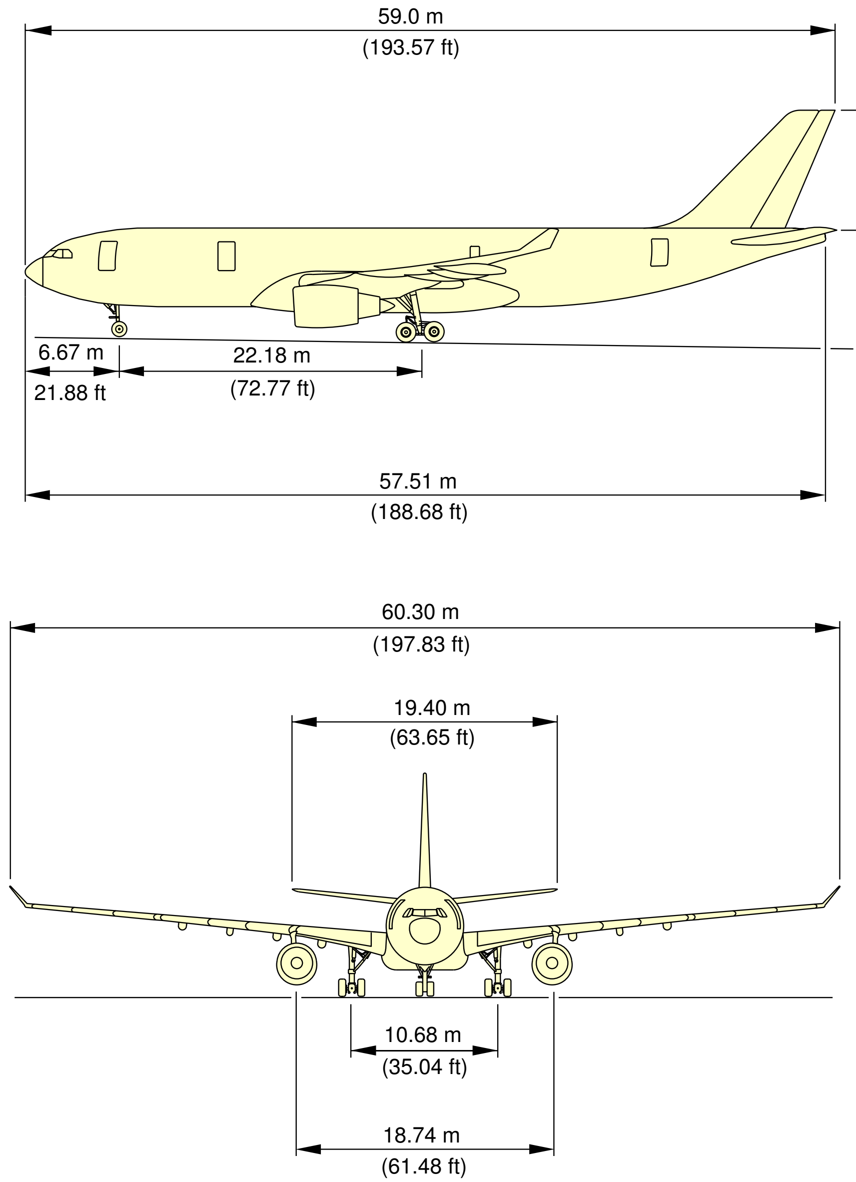
****ON A/C A330-200 A330-300**

DESC 09-10-03-001-A01

General

1. This chapter gives the main dimensions of the A330-200 and A330-300 aircraft (see FIGURE 09-10-03-991-001-AFIGURE 09-10-03-991-001-B and FIGURE 09-10-03-991-002-AFIGURE 09-10-03-991-002-B).

**ON A/C A330-200



A= 9.30 m (30.51 ft) Pre–mod 48979
8.80 m (29 ft) Post–mod 48979

NOTE: RELATED TO AIRCRAFT ATTITUDE AND WEIGHT

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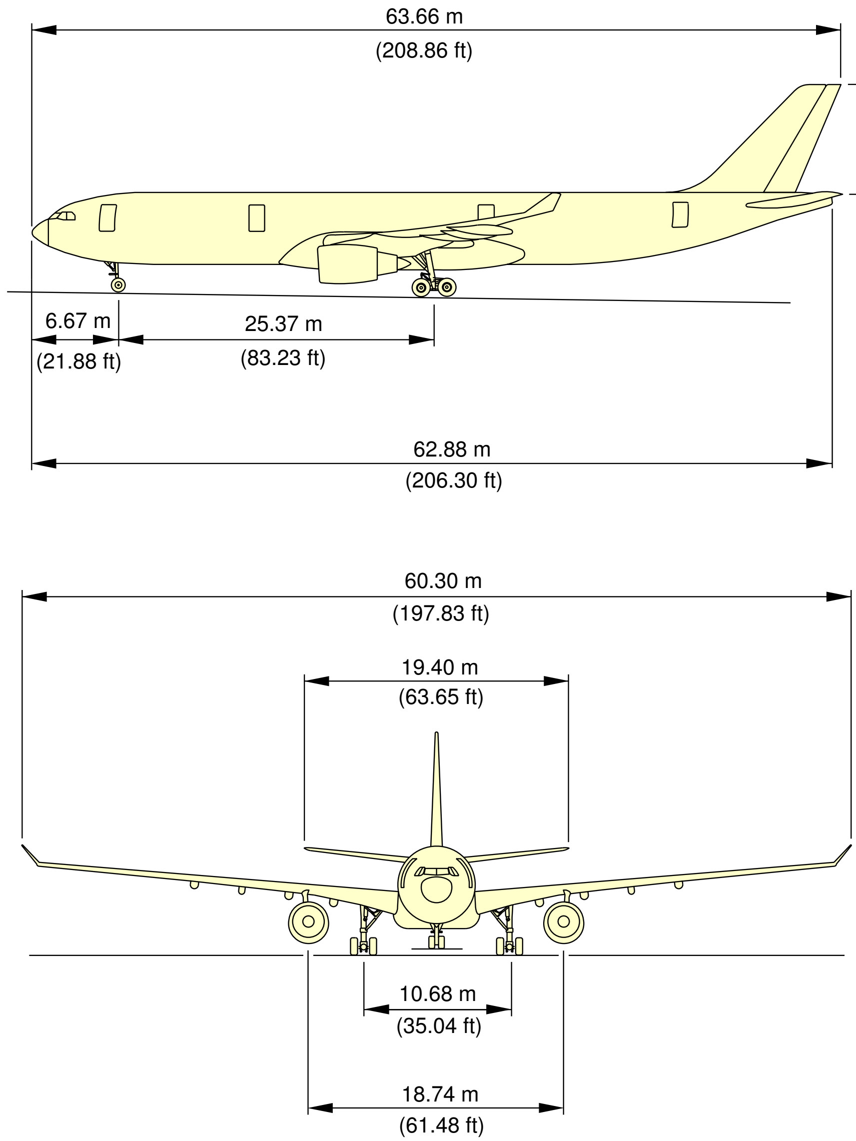
Aircraft Dimensions
Side and Front View
FIGURE-09-10-03-991-001-A01

**ON A/C A330-300



NOTE: RELATED TO AIRCRAFT ATTITUDE AND WEIGHT

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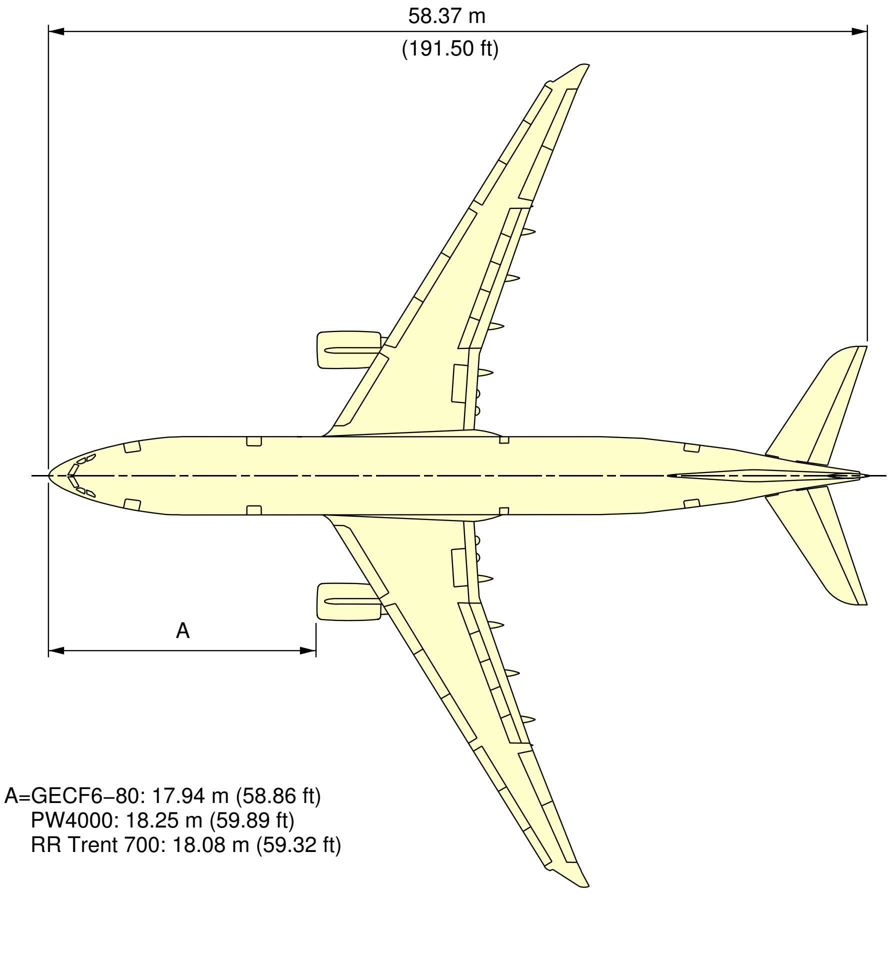
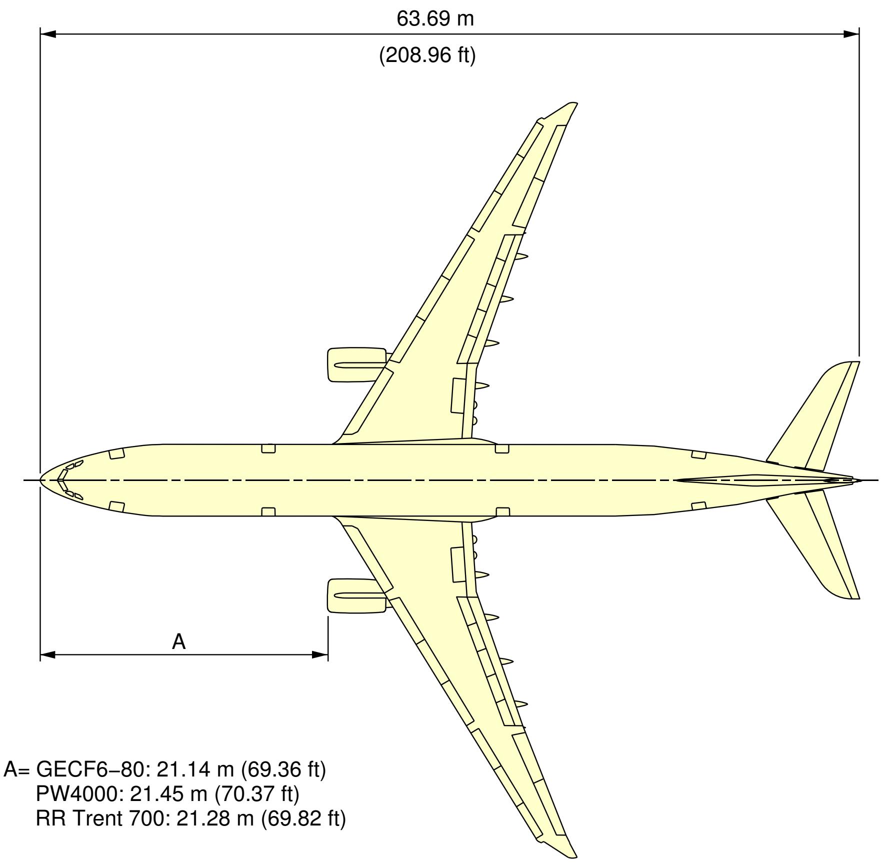
Aircraft Dimensions
Side and Front View
FIGURE-09-10-03-991-001-B01

**ON A/C A330-200



Aircraft Dimensions
Top View
FIGURE-09-10-03-991-002-A01

**ON A/C A330-300



Aircraft Dimensions
Top View
FIGURE-09-10-03-991-002-B01

09-10-04 AIRCRAFT STRUCTURAL SECTIONS

****ON A/C A330-200 A330-300**

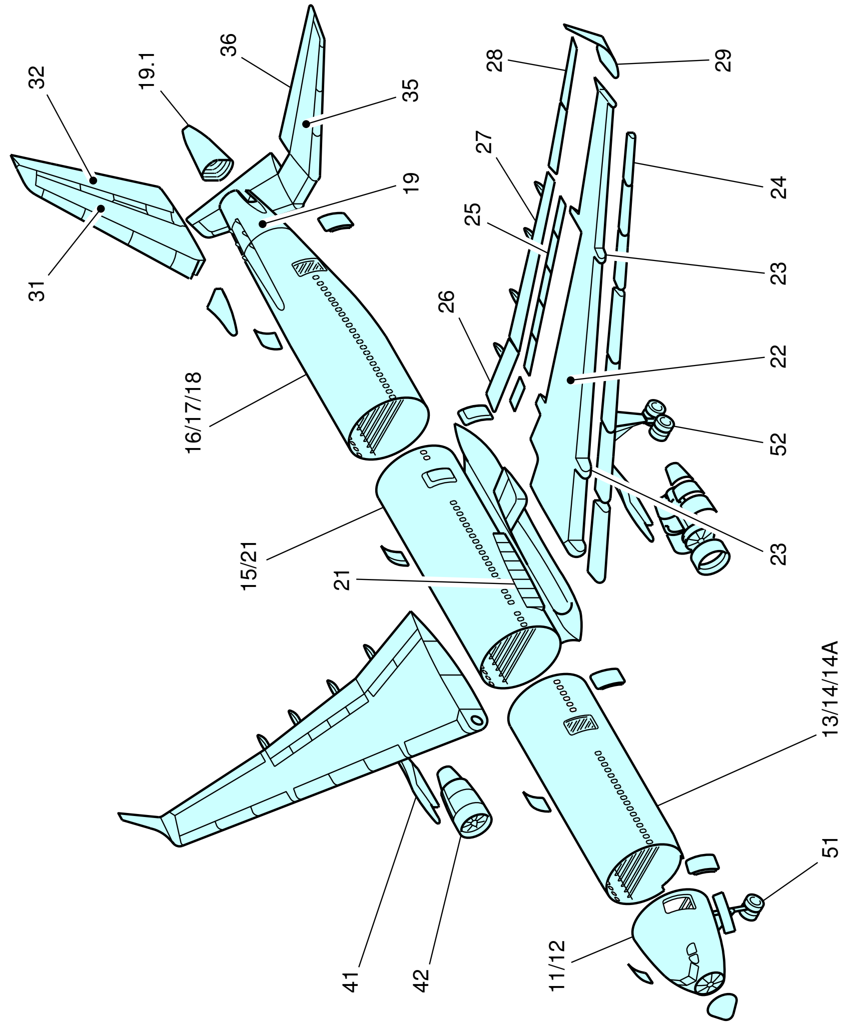
DESC 09-10-04-001-A01

General

1. Sections and Components
   For the different structural sections and components of the aircraft, see FIGURE 09-10-04-991-002-A.

**ON A/C A330-200 A330-300

SECTION	DESIGNATION
11/12	NOSE FORWARD FUSELAGE
13/14/14A	FORWARD FUSELAGE
15/21	CENTER FUSELAGE
16/17/18	REAR FUSELAGE
19	CONE/REAR FUSELAGE
19.1	CONE/REAR FUSELAGE
21	CENTER WING
22	OUTER WING
23	LEADING EDGE
24	LEADING EDGE
25	SPOILERS
26	INBOARD FLAP
27	OUTBOARD FLAP
28	AILERONS
29	WING–TIP
31	VERTICAL STABILIZER
32	RUDDER
35	HORIZONTAL STABILIZER
36	ELEVATOR
41	PYLONS
42	NACELLE SECTION
51	NOSE GEAR AND DOORS
52	MAIN GEAR AND DOORS



Aircraft Structural Sections
Structure Sections and Components
FIGURE-09-10-04-991-002-A01

09-10-05 COMPOSITE MATERIALS

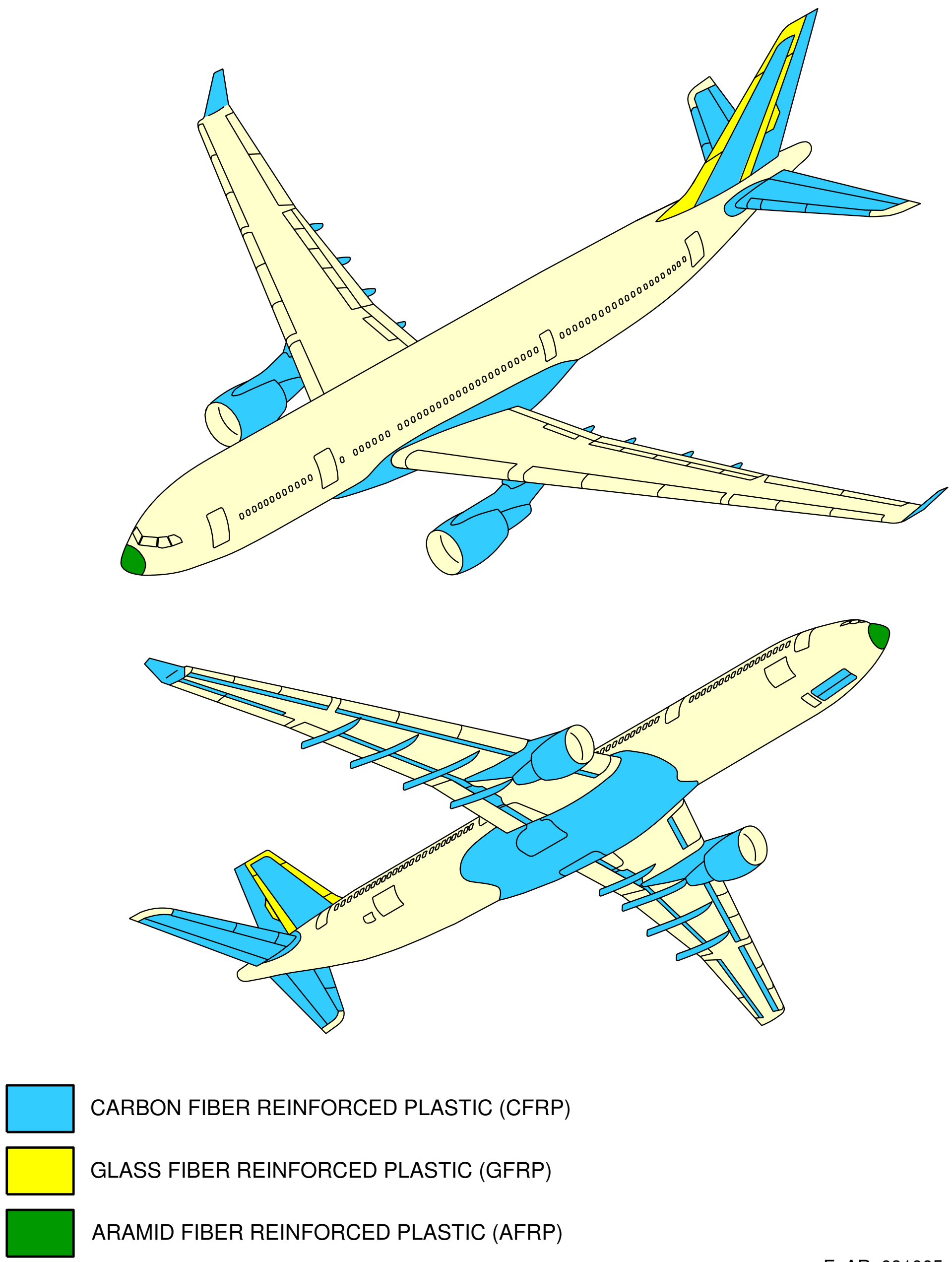
****ON A/C A330-200 A330-300**

DESC 09-10-05-001-A01

General

1. Types of Material
   Some components and sections of the aircraft structure are made from composite materials, see FIGURE 09-10-05-991-001-A. The types of materials used are:
   - Carbon Fiber Reinforced Plastic (CFRP),
   - Glass Fiber Reinforced Plastic (GFRP),
   - Aramid Fiber Reinforced Plastic (AFRP).

**ON A/C A330-200 A330-300



Composite Materials
Location of Composite Materials on the External Surfaces of the Aircraft
FIGURE-09-10-05-991-001-A01

09-10-06 FUSELAGE FRAMES AND H-ARM TABLE

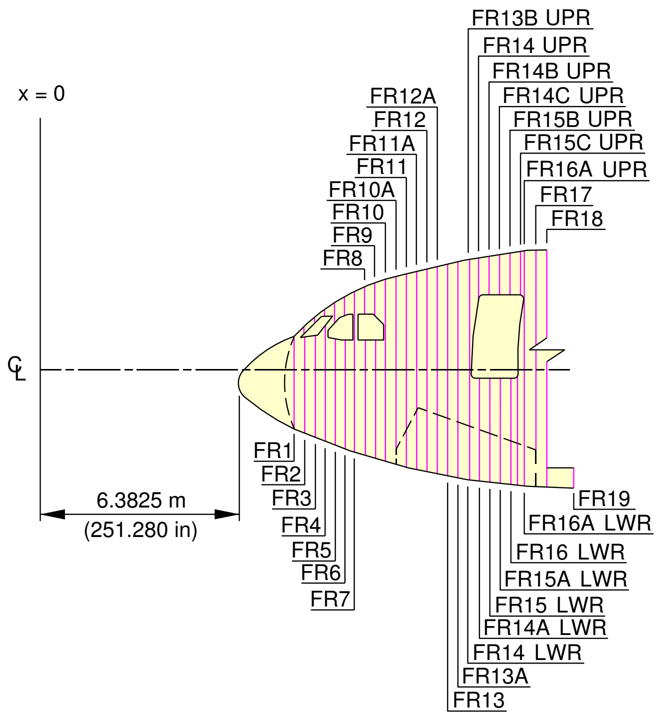
****ON A/C A330-200 A330-300**

DESC 09-10-06-001-A01

General

1. This chapter gives the H-Arm of each frame.
   The H-arm is used to calculate the CG. The H-arm is the length of the lever arm from the above datum point to the specific station. The datum point is at 6.3825 m (251.280 in) forward of the radome.

**ON A/C A330-200



FR	H-ARM m (in)	FR	H-ARM m (in)	FR	H-ARM m (in)
NOSE	6.3825 (251.280)	11	10.1875 (401.083)	15 LWR	12.1155 (476.988)
1	7.6625 (301.673)	11A	10.4275 (410.532)	15A LWR	12.3595 (486.595)
2	7.9425 (312.697)	12	10.6675 (419.981)	15B UPR	12.5635 (494.626)
3	8.1495 (320.847)	12A	10.9075 (429.429)	15C UPR	12.8055 (504.154)
4	8.3555 (328.957)	13	11.1475 (438.878)	16 LWR	12.6035 (496.201)
5	8.5825 (337.894)	13A	11.3875 (448.327)	16A LWR	12.8495 (505.886)
6	8.8095 (346.831)	13B UPR	11.6125 (457.185)	16A UPR	13.0471 (513.666)
7	9.0365 (355.768)	14 LWR	11.6275 (457.776)	17	13.1535 (517.855)
8	9.2635 (364.705)	14 UPR	11.8375 (466.043)	18	13.3985 (527.500)
9	9.4905 (373.642)	14A LWR	11.8715 (467.382)	19	13.9285 (548.366)
10	9.7175 (382.579)	14B UPR	12.0795 (475.571)		
10A	9.9525 (391.831)	14C UPR	12.3215 (485.099)		

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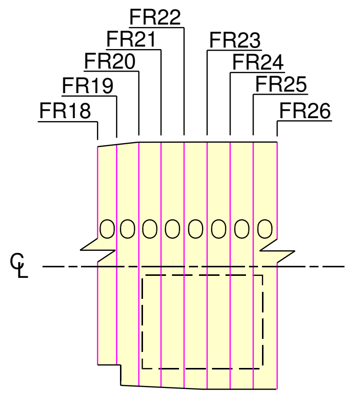
Fuselage Frames and H-arm
Section 11/12 (Sheet 1 of 6)
FIGURE-09-10-06-991-001-A01

**ON A/C A330-200



FR	H–ARM m (in)
18	13.3985 (527.500)
19	13.9285 (548.366)
20	14.4585 (569.233)
21	14.9885 (590.009)
22	15.5185 (610.965)
23	16.0485 (631.831)
24	16.5785 (652.697)
25	17.1085 (673.563)
26	17.6385 (694.430)

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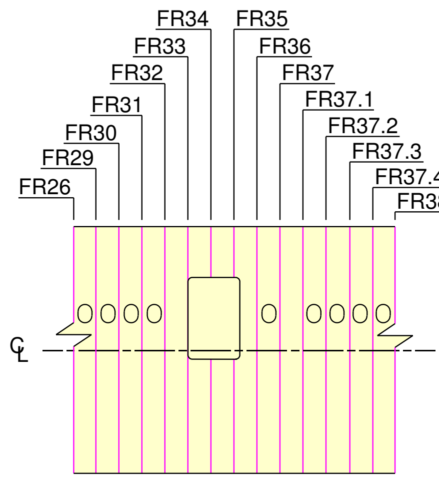
Fuselage Frames and H-arm
Section 13 (Sheet 2 of 6)
FIGURE-09-10-06-991-001-A01

**ON A/C A330-200



FR	H–ARM m (in)	FR	H–ARM m (in)
26	17.6385 (694.430)	36	21.8785 (861.359)
29	18.1685 (715.296)	37	22.4085 (882.225)
30	18.6985 (736.162)	37.1	22.9385 (903.091)
31	19.2285 (757.028)	37.2	23.4685 (923.957)
32	19.7585 (777.894)	37.3	23.9985 (944.823)
33	20.2885 (798.760)	37.4	24.5285 (965.689)
34	20.8185 (819.626)	38	25.0585 (986.556)
35	21.3485 (840.493)		

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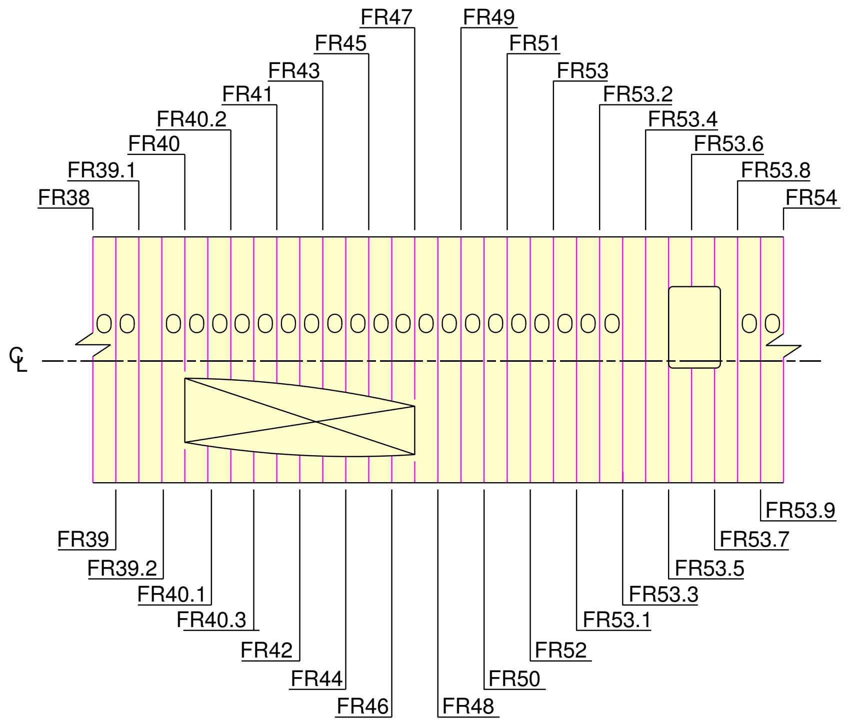
Fuselage Frames and H-arm
Section 14 (Sheet 3 of 6)
FIGURE-09-10-06-991-001-A01

**ON A/C A330-200



FR	H–ARM m (in)	FR	H–ARM m (in)	FR	H–ARM m (in)	FR	H–ARM m (in)
38	25.0585 (966.556)	41	29.2985 (1153.485)	49	33.5432 (1320.598)	53.4	37.7973 (1488.083)
39	25.5885 (1007.422)	42	29.8285 (1174.351)	50	34.0756 (1341.559)	53.5	38.3273 (1508.949)
39.1	26.1185 (1028.288)	43	30.3585 (1195.217)	51	34.6079 (1362.516)	53.6	38.8573 (1529.815)
39.2	26.6485 (1049.154)	44	30.8885 (1216.083)	52	35.1403 (1383.476)	53.7	39.3873 (1550.681)
40	27.1875 (1070.374)	45	31.4185 (1236.949)	53	35.6726 (1404.433)	53.8	39.9173 (1571.547)
40.1	27.7085 (1090.886)	46	31.9485 (1257.816)	53.1	36.2050 (1425.394)	53.9	40.4475 (1592.421)
40.2	28.2385 (1111.752)	47	32.4785 (1278.682)	53.2	36.7373 (1446.350)	54	40.9773 (1613.280)
40.3	28.7685 (1132.619)	48	33.0109 (1299.642)	53.3	37.2673 (1467.217)		

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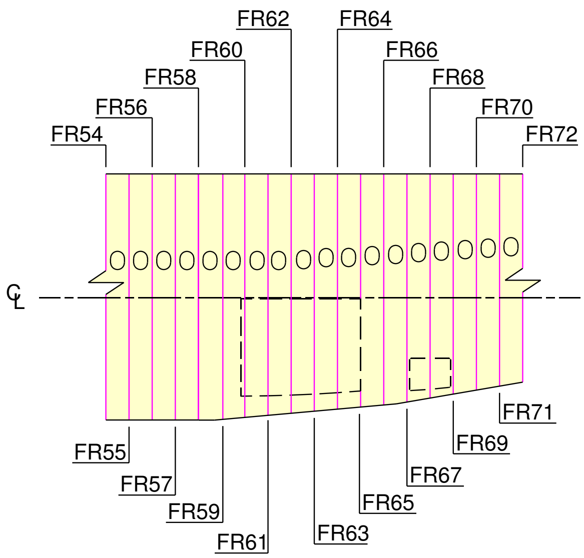
Fuselage Frames and H-arm
Section 15/21 (Sheet 4 of 6)
FIGURE-09-10-06-991-001-A01

**ON A/C A330-200



FR	H–ARM m (in)	FR	H–ARM m (in)	FR	H–ARM m (in)
54	40.9773 (1613.280)	61	44.6873 (1759.343)	68	48.3973 (1905.406)
55	41.5073 (1634.146)	62	45.2173 (1780.209)	69	48.9273 (1926.272)
56	42.0373 (1655.012)	63	45.7473 (1801.075)	70	49.4573 (1947.138)
57	42.5673 (1675.878)	64	46.2773 (1664.461)	71	49.9873 (1968.004)
58	43.0973 (1696.744)	65	46.8073 (1842.807)	72	50.5173 (1988.870)
59	43.6273 (1717.610)	66	47.3373 (1863.673)		
60	44.1573 (1738.476)	67	47.8673 (1884.539)		

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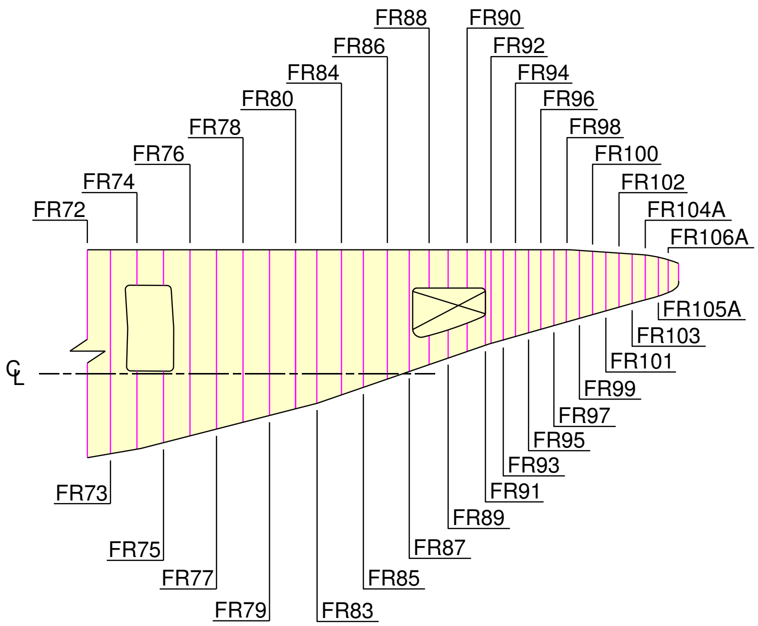
Fuselage Frames and H-arm
Sections 16 and 17 (Sheet 5 of 6)
FIGURE-09-10-06-991-001-A01

**ON A/C A330-200



FR	H–ARM m (in)	FR	H–ARM m (in)	FR	H–ARM m (in)	FR	H–ARM m (in)
72	50.5173 (1988.870)	83	55.8133 (2197.374)	92	59.8313 (2355.563)	101	62.6043 (2464.736)
73	51.0473 (2009.736)	84	56.3393 (2218.083)	93	60.1193 (2366.902)	102	62.8893 (2475.957)
74	51.6533 (2033.594)	85	56.8663 (2238.831)	94	60.4193 (2378.713)	103	63.1743 (2487.177)
75	52.2593 (2057.453)	86	57.3923 (2259.539)	95	60.7193 (2390.524)	104A	63.3943 (2495.839)
76	52.8653 (2081.311)	87	57.9193 (2280.287)	96	61.0393 (2403.122)	105A	63.6143 (2504.500)
77	53.4713 (2105.169)	88	58.3693 (2298.004)	97	61.3593 (2415.721)	106A	63.8243 (2512.768)
78	54.0773 (2129.028)	89	58.8193 (2315.721)	98	61.6793 (2428.319)		
79	54.6833 (2152.886)	90	59.2693 (2333.437)	99	61.9993 (2440.917)		
80/82	55.2873 (2176.665)	91	59.6193 (2347.217)	100	62.3193 (2453.516)		

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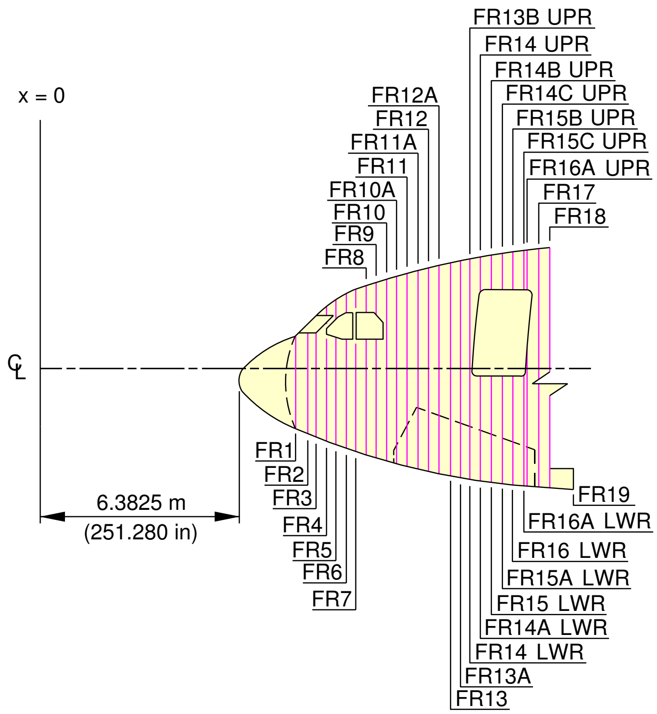
Fuselage Frames and H-arm
Sections 18 and 19/19.1 (Sheet 6 of 6)
FIGURE-09-10-06-991-001-A01

**ON A/C A330-300



FR	H–ARM m (in)	FR	H–ARM m (in)	FR	H–ARM m (in)
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1	7.6625 (301.673)	11A	10.4275 (410.532)	15A LWR	12.3595 (486.595)
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3	8.1495 (320.847)	12A	10.9075 (429.429)	15C UPR	12.8055 (504.154)
4	8.3555 (328.957)	13	11.1475 (438.878)	16 LWR	12.6035 (496.201)
5	8.5825 (337.894)	13A	11.3875 (448.327)	16A LWR	12.8495 (505.886)
6	8.8095 (346.831)	13B UPR	11.6125 (457.185)	16A UPR	13.0471 (513.666)
7	9.0365 (355.768)	14 LWR	11.6275 (457.776)	17	13.1535 (517.855)
8	9.2635 (364.705)	14 UPR	11.8375 (466.043)	18	13.3985 (527.500)
9	9.4905 (373.642)	14A LWR	11.8715 (467.382)	19	13.9285 (548.366)
10	9.7175 (382.579)	14B UPR	12.0795 (475.571)		
10A	9.9525 (391.831)	14C UPR	12.3215 (485.099)		

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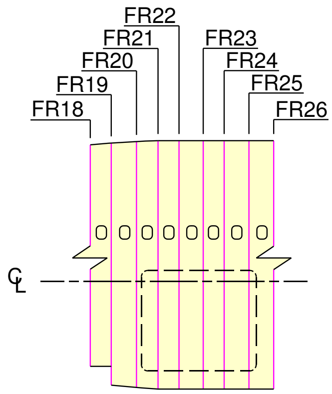
Fuselage Frames and H-arm
Section 11/12 (Sheet 1 of 6)
FIGURE-09-10-06-991-001-B01

**ON A/C A330-300



FR	H–ARM m (in)
18	13.3985 (527.500)
19	13.9285 (548.366)
20	14.4585 (569.233)
21	14.9885 (590.009)
22	15.5185 (610.965)
23	16.0485 (631.831)
24	16.5785 (652.697)
25	17.1085 (673.563)
26	17.6385 (694.430)

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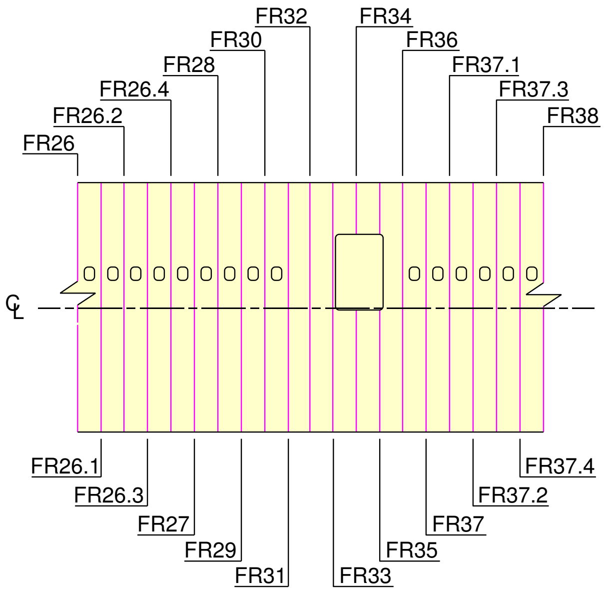
Fuselage Frames and H-arm
Section 13 (Sheet 2 of 6)
FIGURE-09-10-06-991-001-B01

**ON A/C A330-300



FR	H–ARM m (in)	FR	H–ARM m (in)	FR	H–ARM m (in)
26	17.6385 (694.430)	29	21.3485 (840.493)	36	25.0585 (986.556)
26.1	18.1685 (715.296)	30	21.8785 (861.359)	37	25.5885 (1007.422)
26.2	18.6985 (736.162)	31	22.4085 (882.225)	37.1	26.1185 (1028.288)
26.3	19.2285 (757.028)	32	22.9385 (903.091)	37.2	26.6519 (1049.287)
26.4	19.7585 (777.894)	33	23.4685 (923.957)	37.3	27.1853 (1070.287)
27	20.2885 (798.760)	34	23.9985 (944.823)	37.4	27.7187 (1091.287)
28	20.8185 (819.626)	35	24.5285 (965.689)	38	28.2521 (1112.287)

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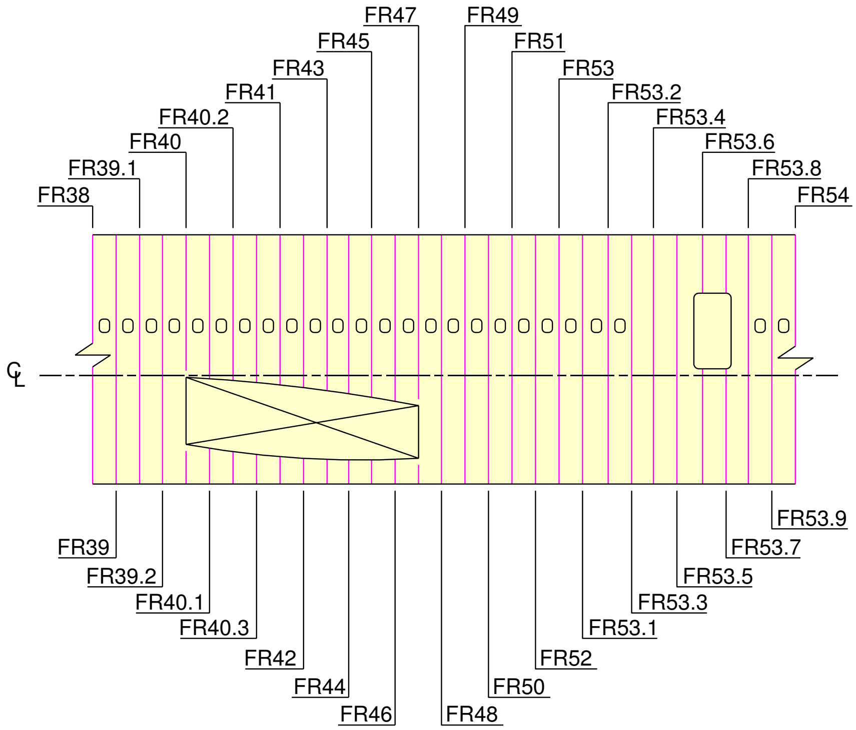
Fuselage Frames and H-arm
Sections 14 and 14A (Sheet 3 of 6)
FIGURE-09-10-06-991-001-B01

**ON A/C A330-300



FR	H–ARM m (in)	FR	H–ARM m (in)	FR	H–ARM m (in)	FR	H–ARM m (in)
38	28.2521 (1112.287)	41	32.4921 (1279.217)	49	36.7368 (1446.331)	53.4	40.9909 (1613.815)
39	28.7821 (1133.154)	42	33.0221 (1300.083)	50	37.2692 (1467.291)	53.5	41.5209 (1634.681)
39.1	29.3121 (1154.020)	43	33.5521 (1320.949)	51	37.8015 (1488.248)	53.6	42.0509 (1655.547)
39.2	29.8421 (1174.886)	44	34.0821 (1341.815)	52	38.3339 (1509.209)	53.7	42.5809 (1676.413)
40	30.3811 (1196.106)	45	34.6121 (1362.681)	53	38.8662 (1530.166)	53.8	43.1109 (1697.280)
40.1	30.9021 (1216.618)	46	35.1421 (1383.547)	53.1	39.3986 (1551.126)	53.9	43.6409 (1718.146)
40.2	31.4321 (1237.484)	47	35.6721 (1404.413)	53.2	39.9309 (1572.083)	54	44.1709 (1739.012)
40.3	31.9621 (1258.350)	48	36.2045 (1425.374)	53.3	40.4609 (1592.949)		

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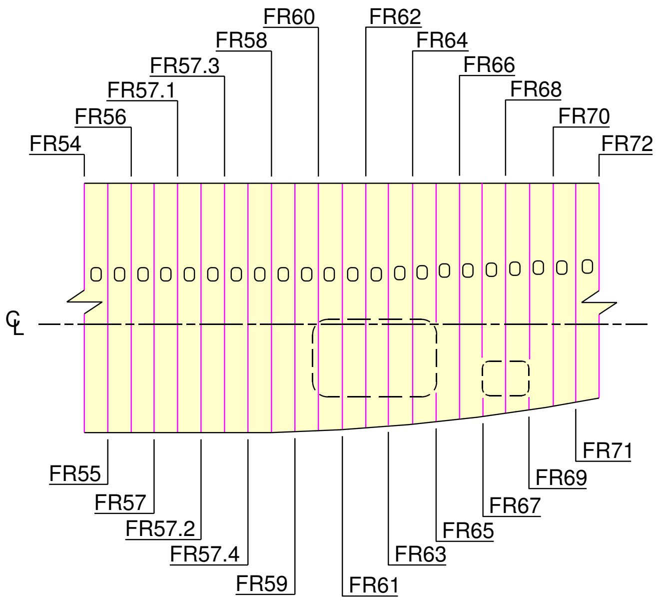
Fuselage Frames and H-arm
Section 15/21 (Sheet 4 of 6)
FIGURE-09-10-06-991-001-B01

**ON A/C A330-300



FR	H–ARM m (in)	FR	H–ARM m (in)	FR	H–ARM m (in)
54	44.1709 (1739.012)	58	48.4245 (1906.476)	66	52.6645 (2073.406)
55	44.7009 (1759.879)	59	48.9545 (1927.343)	67	53.1945 (2094.272)
56	45.2309 (1780.744)	60	49.4845 (1948.209)	68	53.7245 (2115.138)
57	45.7609 (1801.610)	61	50.0145 (1969.075)	69	54.2545 (2136.004)
57.1	46.2909 (1822.476)	62	50.5445 (1989.941)	70	54.7845 (2156.870)
57.2	46.8243 (1843.476)	63	51.0745 (2010.807)	71	55.3145 (2177.736)
57.3	47.3577 (1864.476)	64	51.6045 (2031.673)	72	55.8445 (2198.602)
57.4	47.8911 (1885.476)	65	52.1345 (2052.539)		

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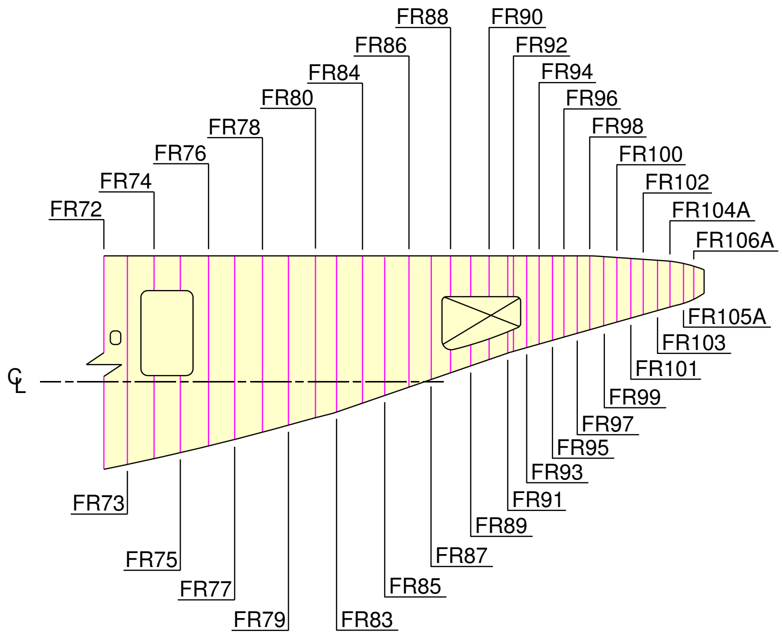
Fuselage Frames and H-arm
Sections 16 and 17 (Sheet 5 of 6)
FIGURE-09-10-06-991-001-B01

**ON A/C A330-300



FR	H–ARM m (in)	FR	H–ARM m (in)	FR	H–ARM m (in)	FR	H–ARM m (in)
72	55.8445 (2198.602)	83	61.1405 (2407.106)	92	65.1585 (2565.295)	101	67.9315 (2674.469)
73	56.3745 (2219.469)	84	61.6665 (2427.815)	93	65.4465 (2576.634)	102	68.2165 (2685.689)
74	56.9805 (2243.327)	85	62.1935 (2448.563)	94	65.7465 (2588.445)	103	68.5015 (2696.910)
75	57.5865 (2267.185)	86	62.7195 (2469.272)	95	66.0465 (2600.256)	104A	68.7215 (2705.571)
76	58.1925 (2291.043)	87	63.2465 (2490.020)	96	66.3665 (2612.854)	105A	68.9415 (2714.232)
77	58.7985 (2314.902)	88	63.6965 (2507.736)	97	66.6865 (2625.453)	106A	69.1515 (2722.500)
78	59.4045 (2338.760)	89	64.1465 (2525.453)	98	67.0065 (2638.051)		
79	60.0105 (2362.618)	90	64.5965 (2543.169)	99	67.3265 (2650.650)		
80/82	60.6145 (2386.398)	91	65.0465 (2560.886)	100	67.6465 (2663.248)		

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Fuselage Frames and H-arm
Sections 18 and 19/19.1 (Sheet 6 of 6)
FIGURE-09-10-06-991-001-B01

09-10-08 WING RIBS AND STATIONS

****ON A/C A330-200 A330-300**

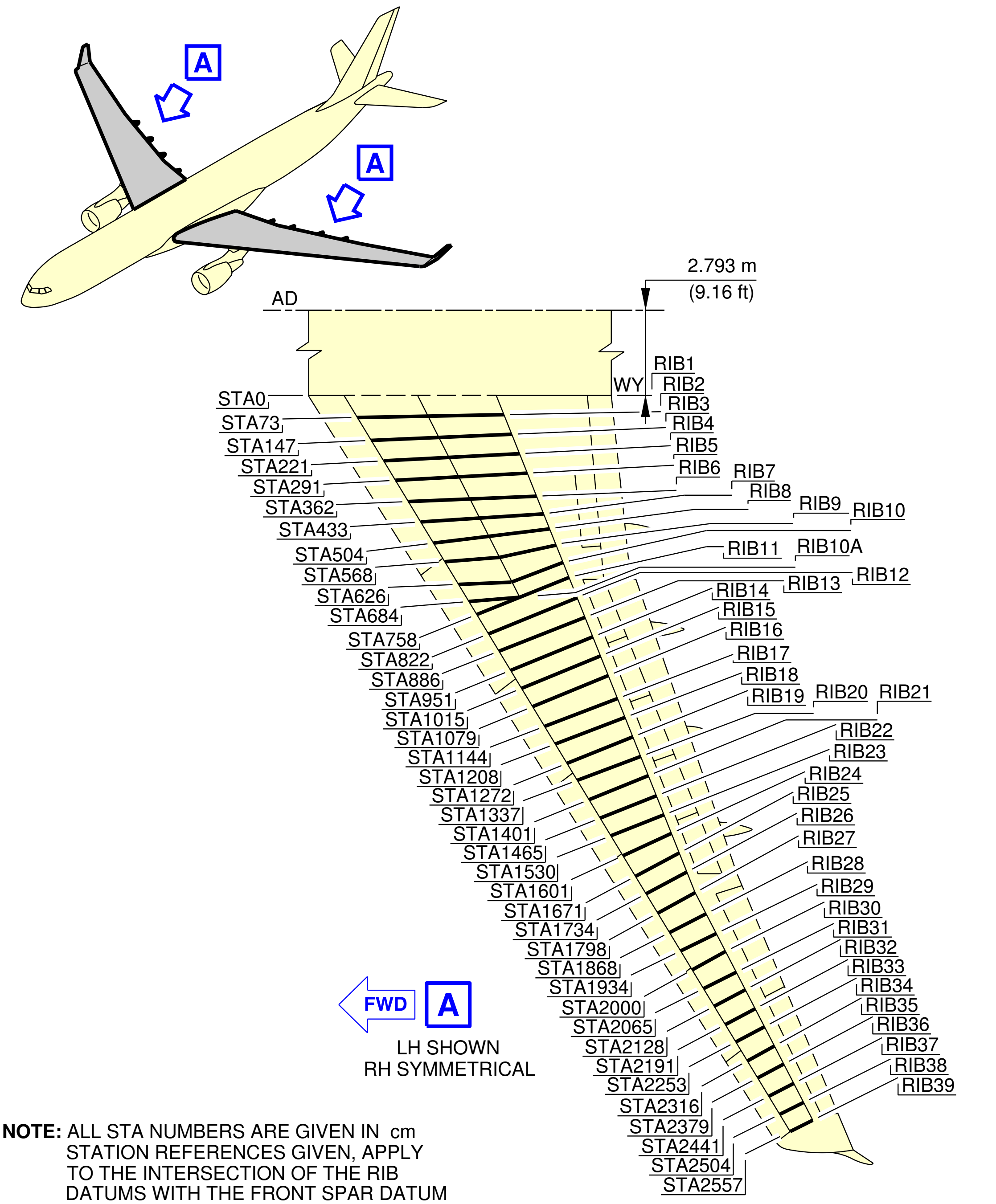
DESC 09-10-08-001-A01

Wing Ribs and Stations

1. General
   This chapter gives the Wing Ribs and Stations, see FIGURE 09-10-08-991-001-A.
   The position of each Wing Rib is identified by a station (STA). All measurements are:
   - At 90 degrees to Rib 1.
   - Measured between Rib 1 and the intersection of each rib datum with the Front Spar datum at the lower outside skin surface.

   NOTE : The stations are given in centimeters with no conversion.

**ON A/C A330-200 A330-300



NOTE: ALL STA NUMBERS ARE GIVEN IN cm
STATION REFERENCES GIVEN, APPLY TO THE INTERSECTION OF THE RIB DATUMS WITH THE FRONT SPAR DATUM AT THE OUTSIDE SKIN SURFACE

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Wing
Ribs and Stations
FIGURE-09-10-08-991-001-A01

09-10-09 HORIZONTAL STABILIZERS RIBS AND STATIONS

****ON A/C A330-200 A330-300**

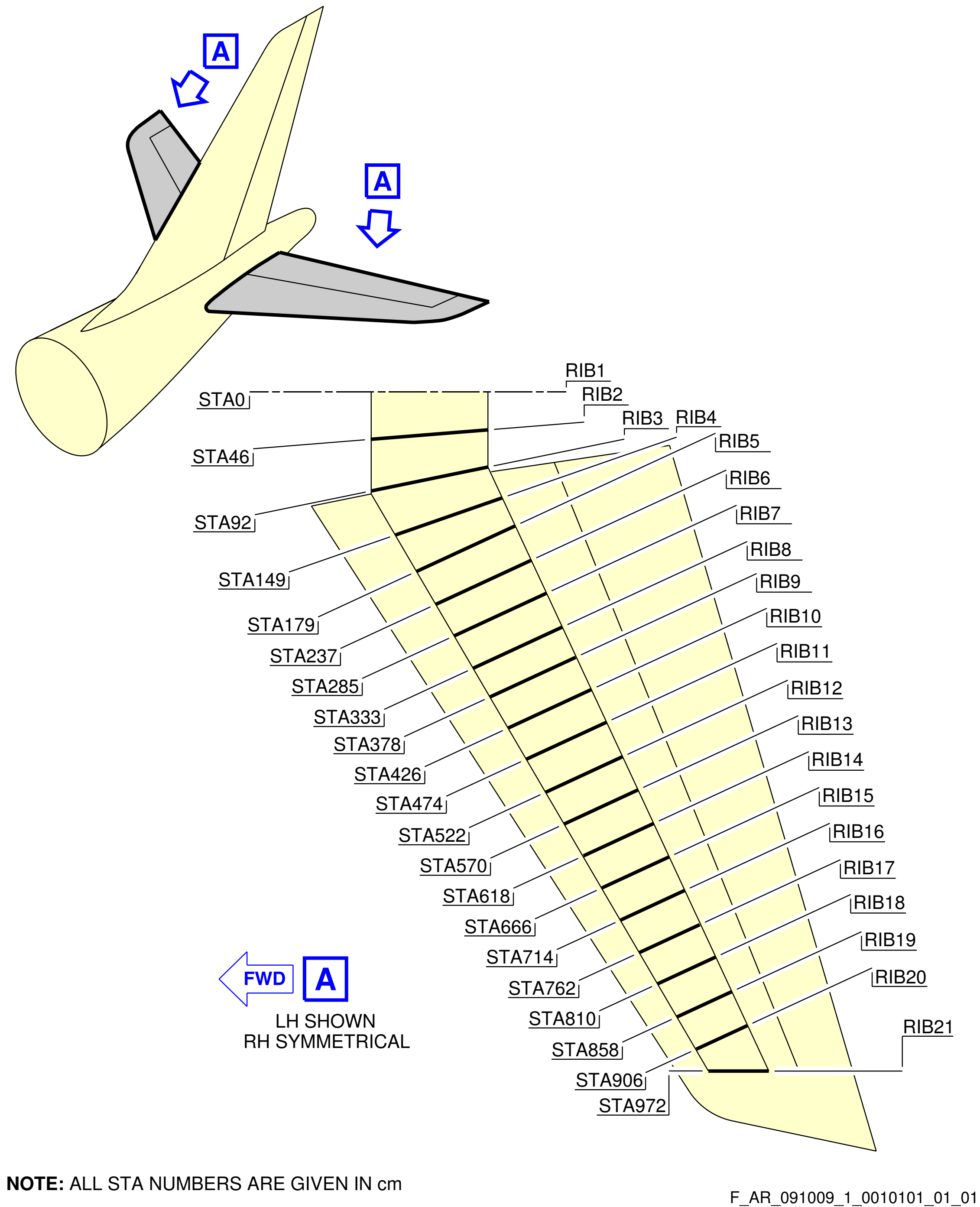
DESC 09-10-09-001-A01

General

1. This chapter gives the horizontal stabilizer ribs and stations, see FIGURE 09-10-09-991-001-A.
   The position of each horizontal stabilizer rib is identified with a station (STA) which is the distance between the rib and RIB1 datum.

   NOTE : The stations are given in centimeters with no conversion.

**ON A/C A330-200 A330-300



Horizontal Stabilizer
Ribs and Stations
FIGURE-09-10-09-991-001-A01

09-10-10 DOOR SIZES AND LOCATIONS

****ON A/C A330-200 A330-300**

DESC 09-10-10-001-A01

General

1. This chapter gives data related to the aircraft doors. There are different types of door installed on the aircraft. The different doors are given in the sections that follow:
   - For the Passenger/Crew doors and Emergency Exit doors, see DESC 09-10-10-002-A01.
   - For the Cargo Compartment doors, see DESC 09-10-10-003-A01.
   - For the Nose Landing Gear doors, see DESC 09-10-10-004-A01.
   - For the Main Landing Gear doors, see DESC 09-10-10-005-A01.
   - For the APU doors, see DESC 09-10-10-006-A01.

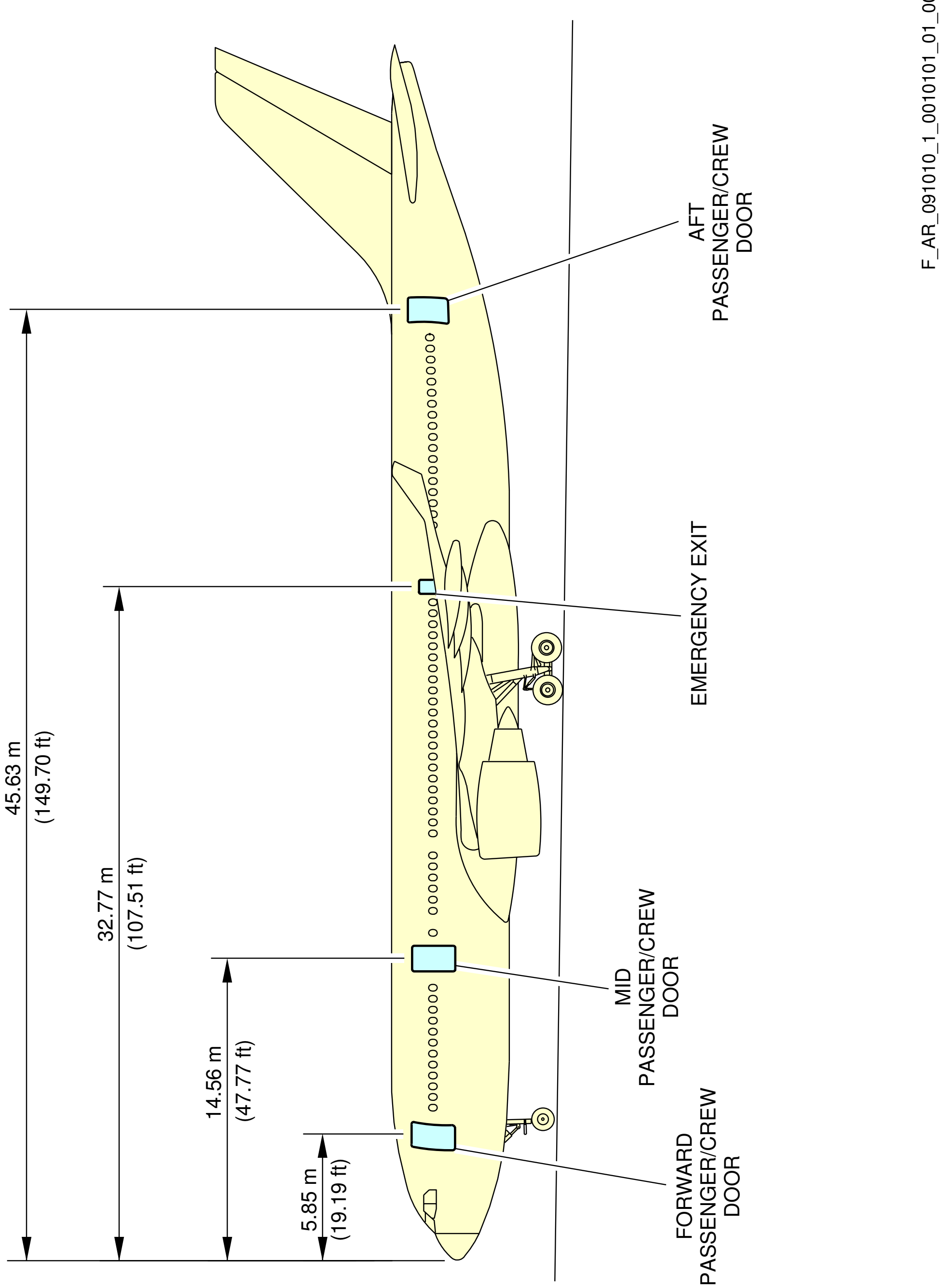
****ON A/C A330-200 A330-300**

DESC 09-10-10-002-A01

Passenger/Crew Doors and Emergency Exit Doors

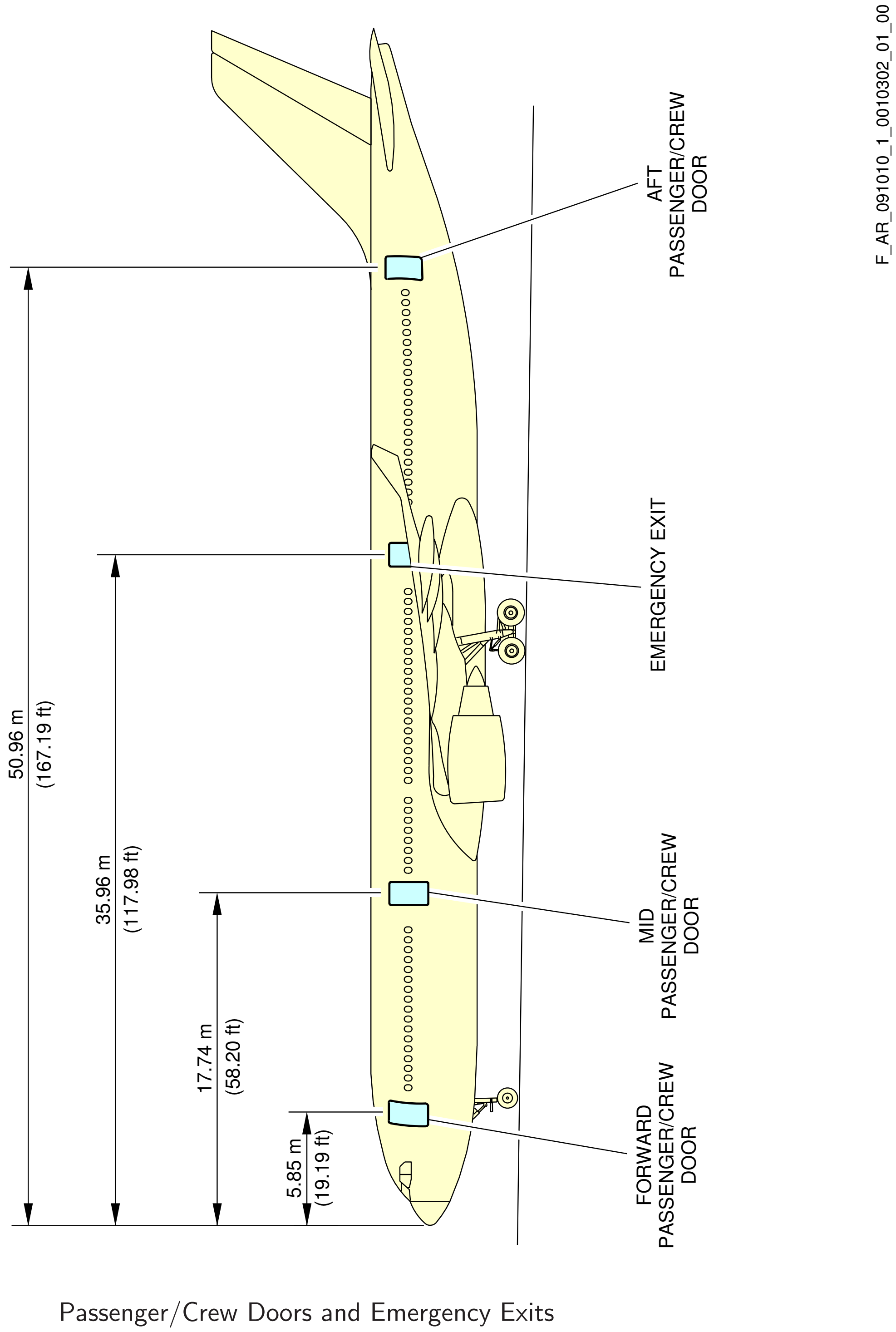
1. General
   This section gives data related to the identification, location and clearances of the passenger/crew and emergency exit doors.
2. Location
   For the location of the passenger/crew and emergency exit doors, see FIGURE 09-10-10-991-001-AFIGURE 09-10-10-991-001-C.
3. Clearances
   For the clearances of these doors:
   - Forward Passenger/Crew doors, see FIGURE 09-10-10-991-002-A.
   - Mid Passenger/Crew doors, see FIGURE 09-10-10-991-003-A.
   - Emergency Exits, see FIGURE 09-10-10-991-004-A.
   - Aft Passenger/Crew doors, see FIGURE 09-10-10-991-005-A.

**ON A/C A330-200



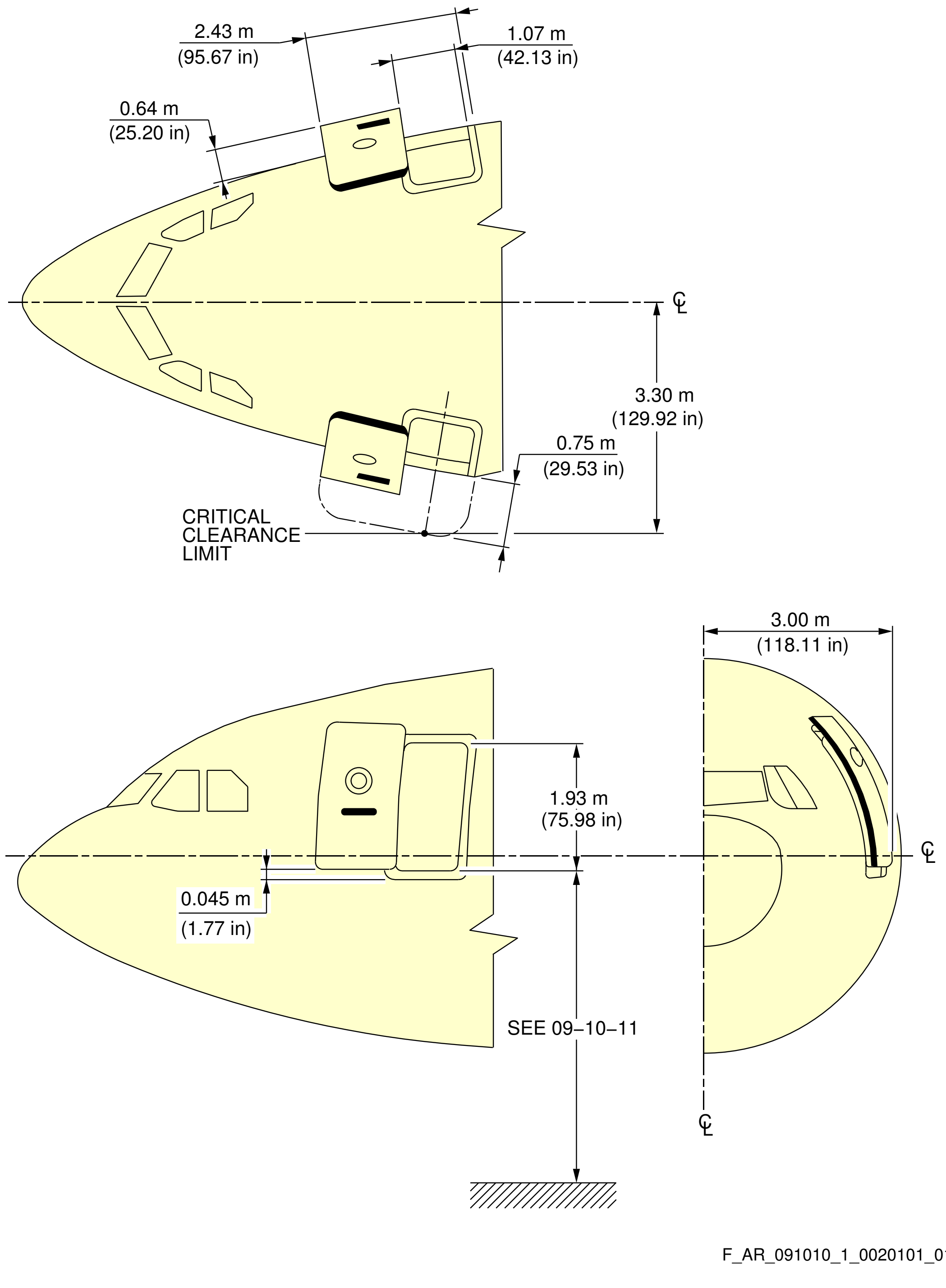
Passenger/Crew Doors and Emergency Exits
Location
FIGURE-09-10-10-991-001-A01

**ON A/C A330-300



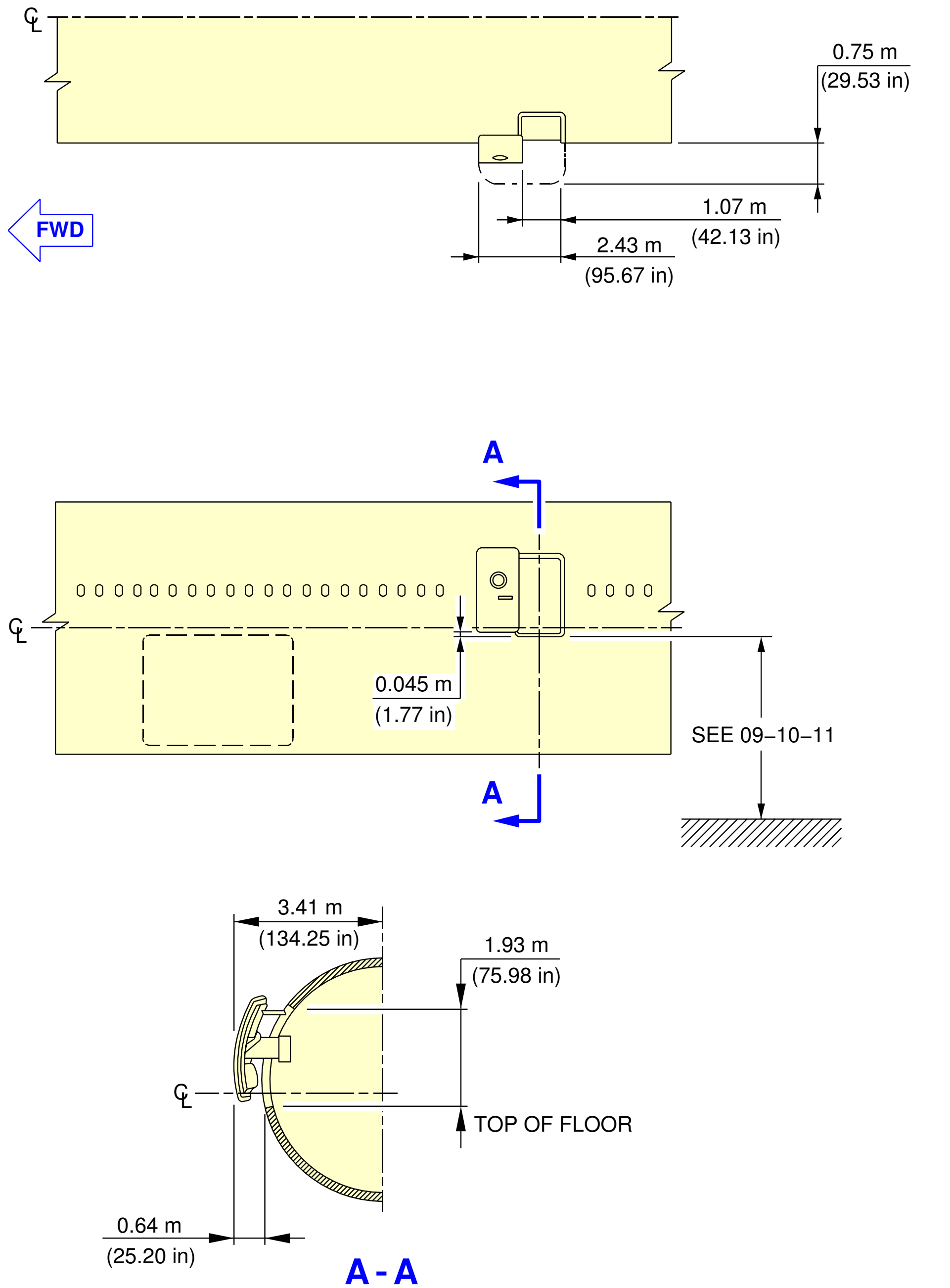
Passenger/Crew Doors and Emergency Exits Location
FIGURE-09-10-10-991-001-C01

**ON A/C A330-200 A330-300



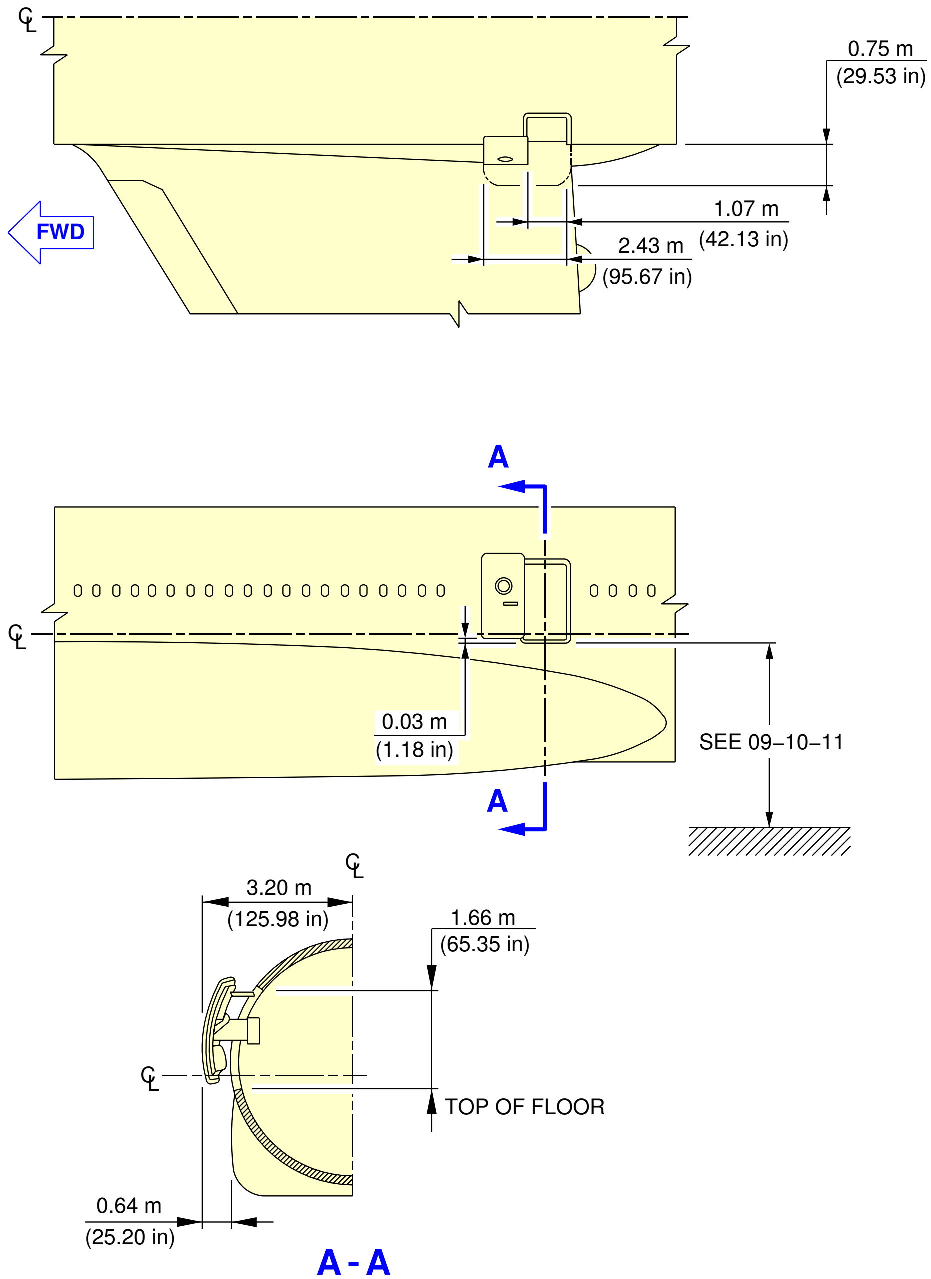
Forward Passenger/Crew Doors
Clearances
FIGURE-09-10-10-991-002-A01

**ON A/C A330-200 A330-300



Mid Passenger/Crew Doors
Clearances
FIGURE-09-10-10-991-003-A01

**ON A/C A330-200 A330-300



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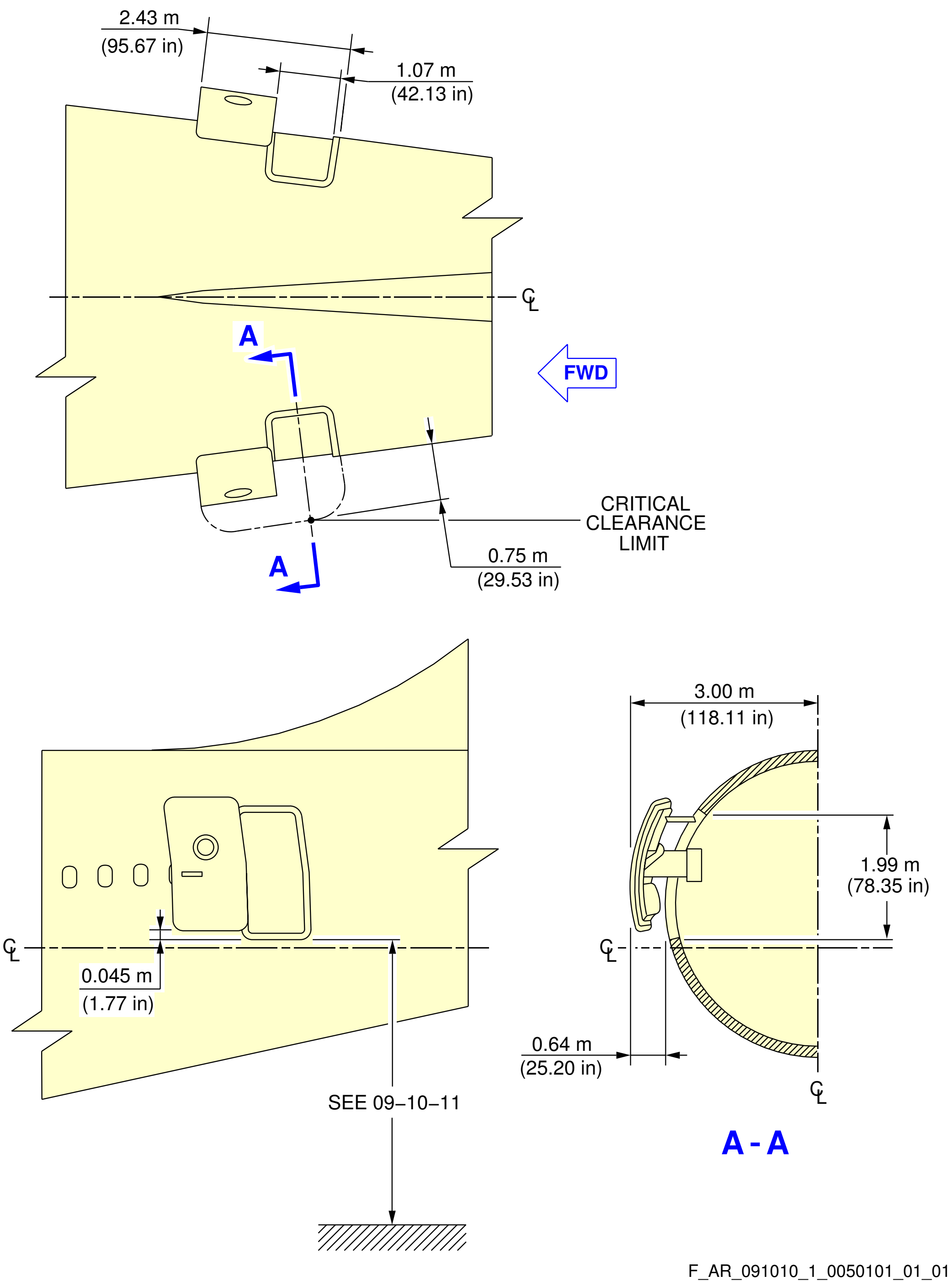
Emergency Exits
Clearances
FIGURE-09-10-10-991-004-A01

**ON A/C A330-200 A330-300



Aft Passenger/Crew Doors
Clearances
FIGURE-09-10-10-991-005-A01

**ON A/C A330-200 A330-300

DESC 09-10-10-003-A01

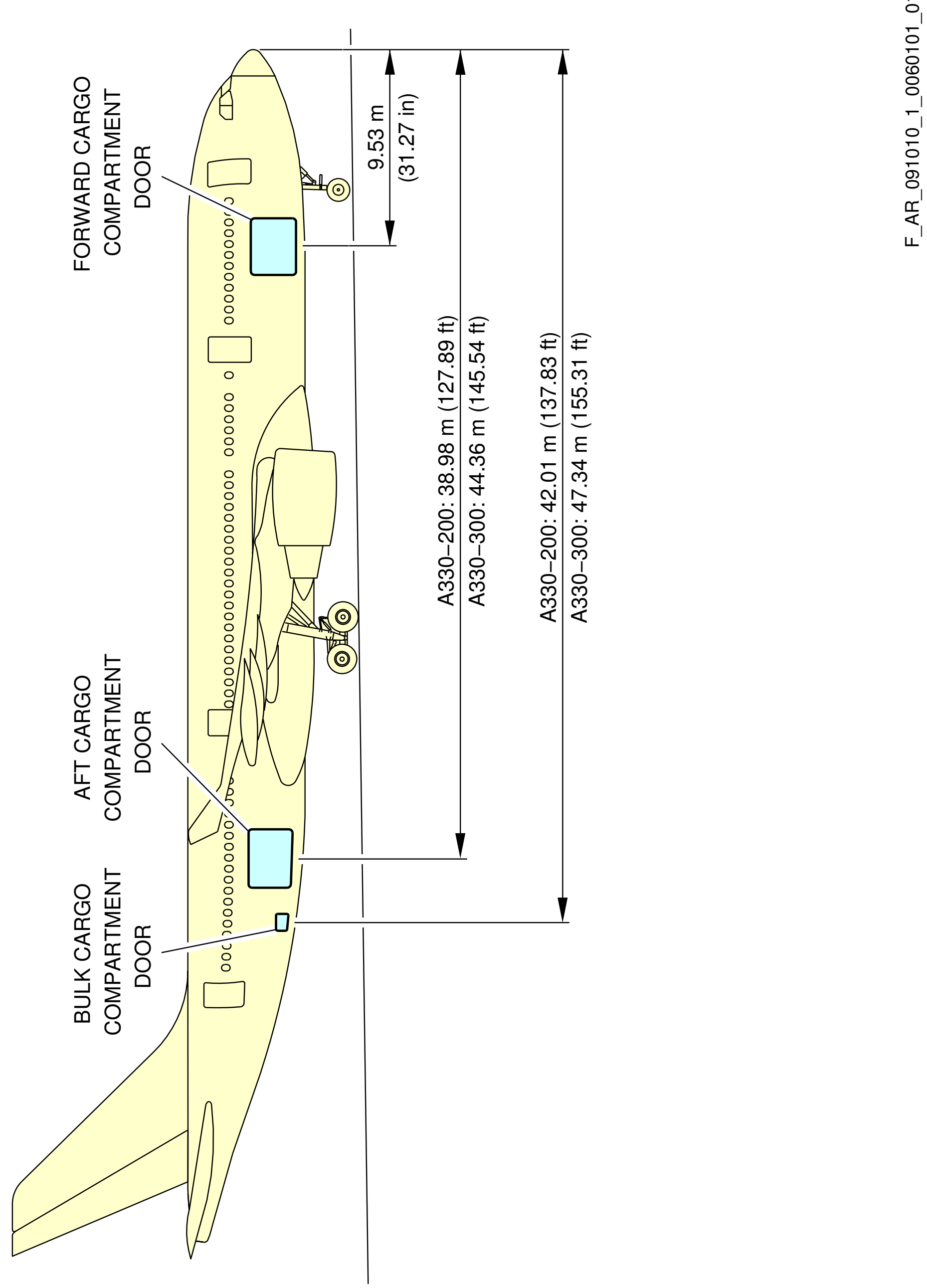
Cargo Compartment Doors

1. General

This section gives data related to the identification, location and clearances of the different cargo compartment doors, see FIGURE 09-10-10-991-006-A. There are three cargo compartments:

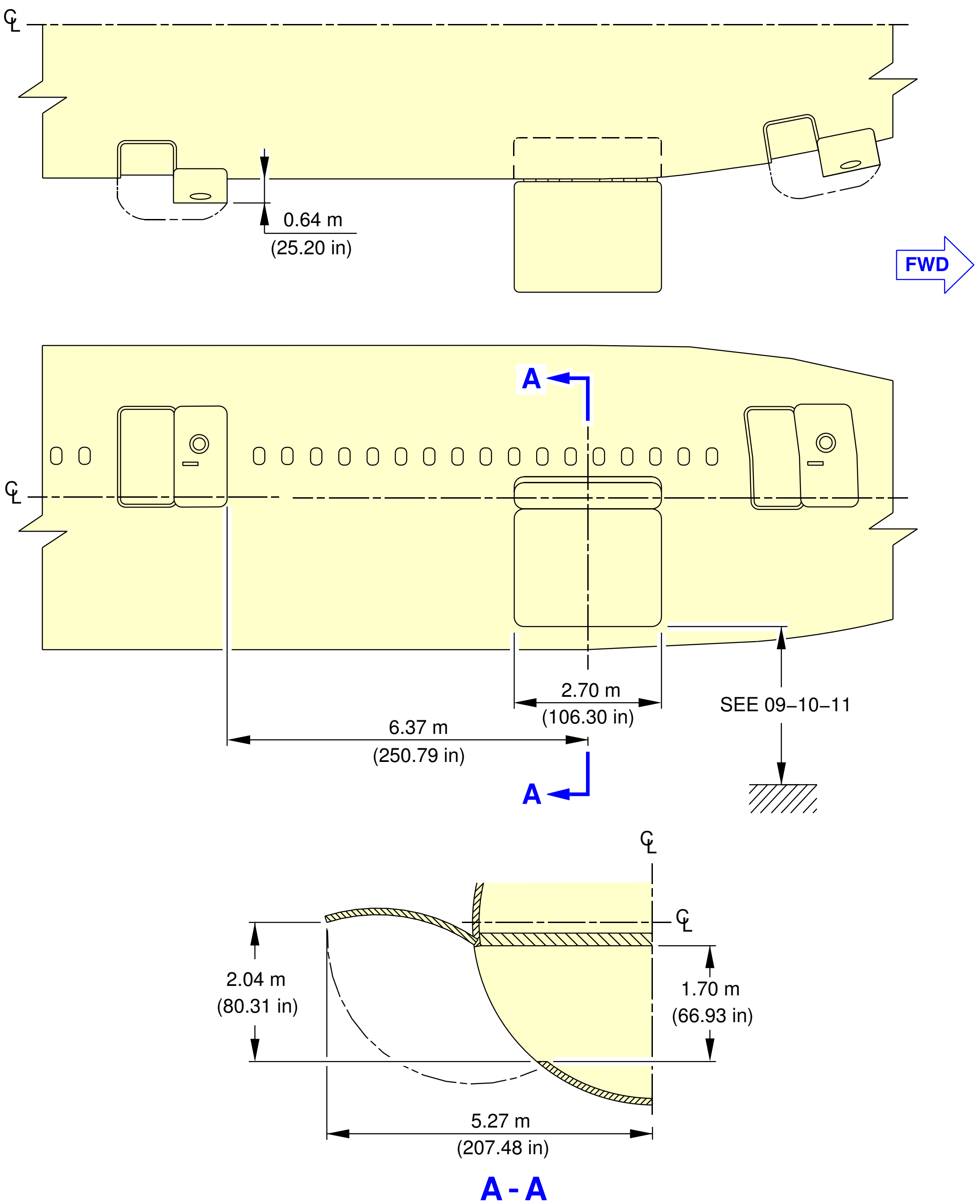
- The forward cargo compartment.
- The aft cargo compartment.
- The bulk cargo compartment.

**ON A/C A330-200 A330-300



Cargo Compartment Doors
Location (Sheet 1 of 4)
FIGURE-09-10-10-991-006-A01

**ON A/C A330-200 A330-300



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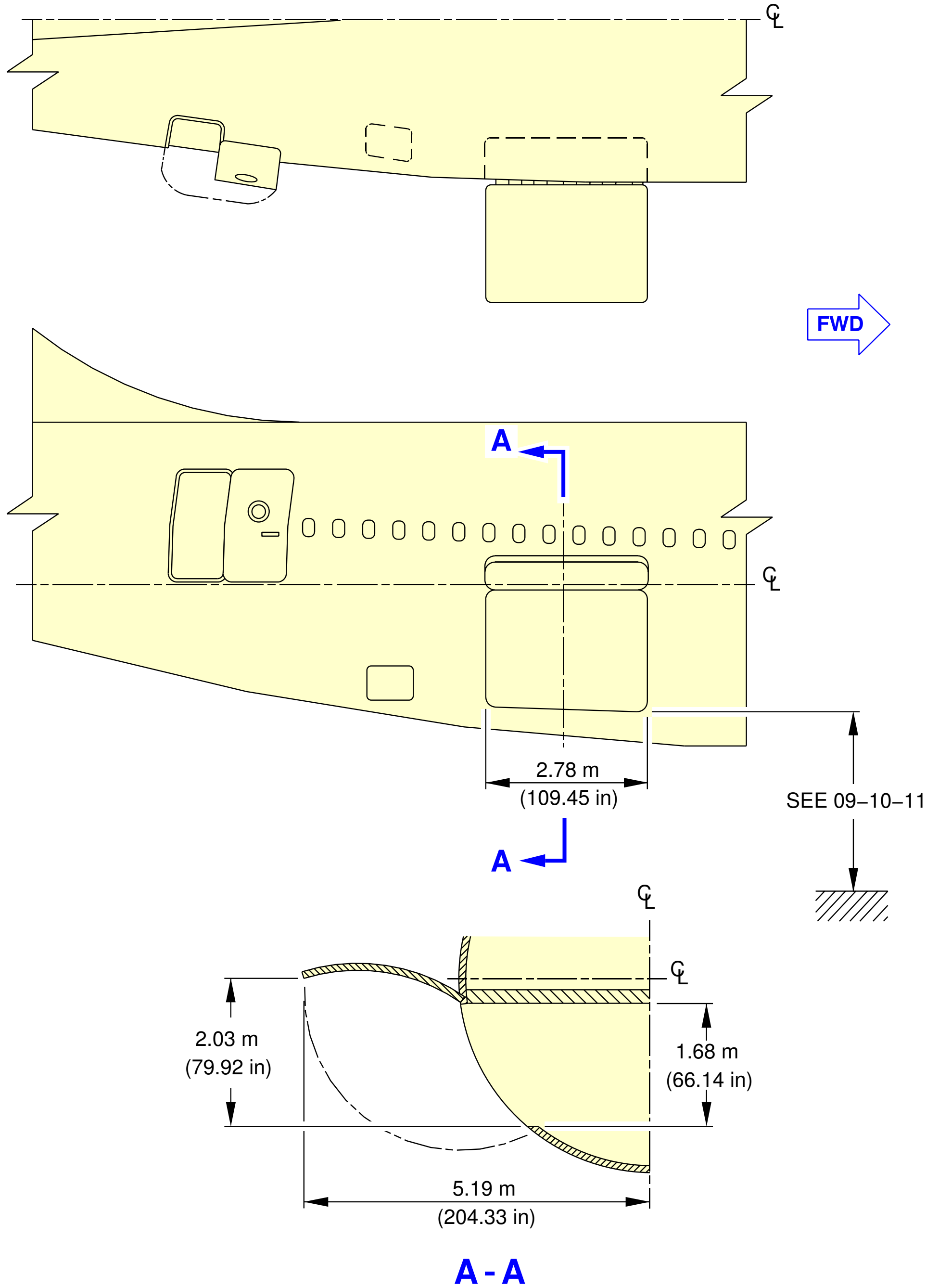
Cargo Compartment Doors
Clearances - Forward Cargo Compartment Door (Sheet 2 of 4)
FIGURE-09-10-10-991-006-A01

**ON A/C A330-200 A330-300



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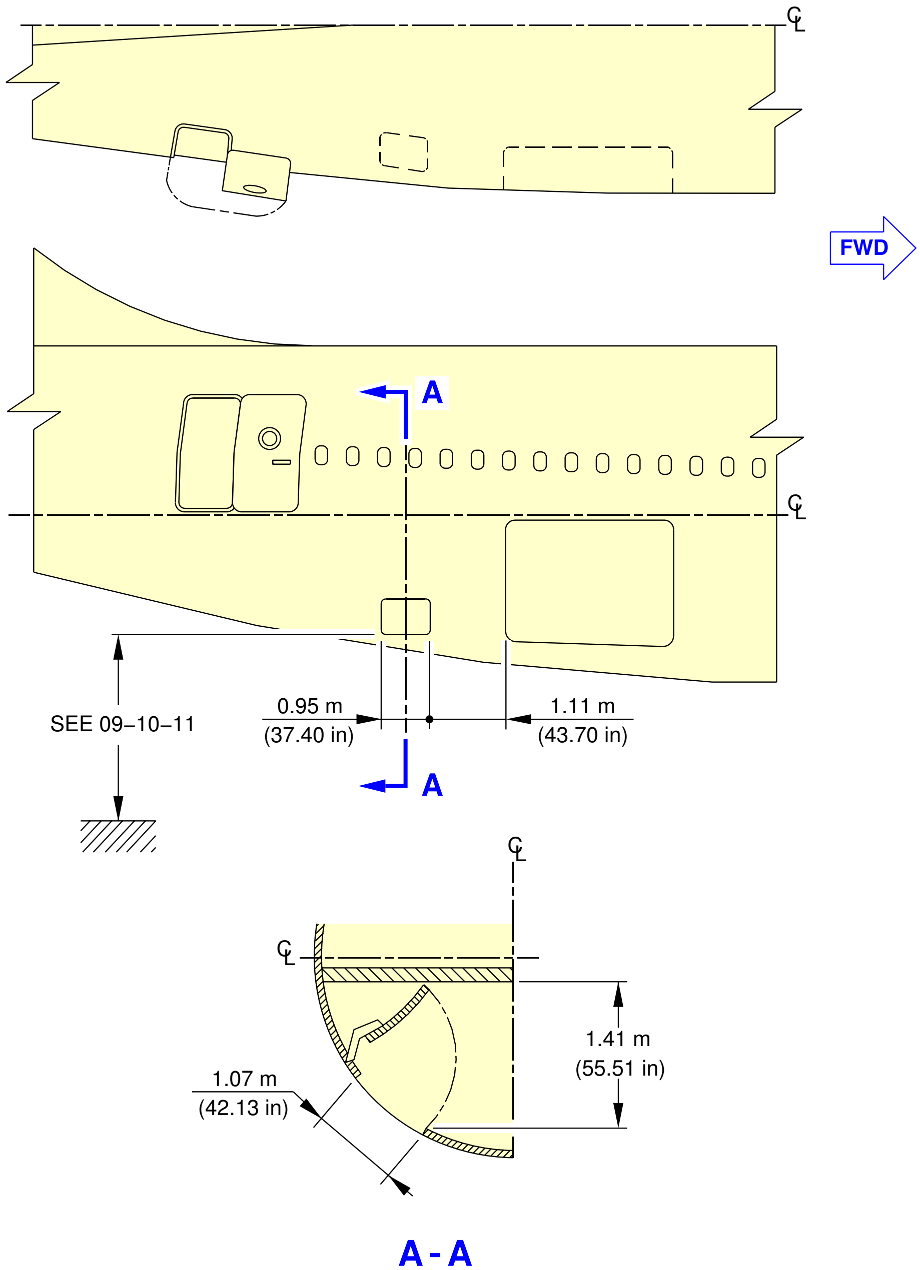
Cargo Compartment Doors
Clearances - Aft Cargo Compartment Door (Sheet 3 of 4)
FIGURE-09-10-10-991-006-A01

**ON A/C A330-200 A330-300



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Cargo Compartment Doors
Clearances - Bulk Cargo Compartment Door (Sheet 4 of 4)
FIGURE-09-10-10-991-006-A01

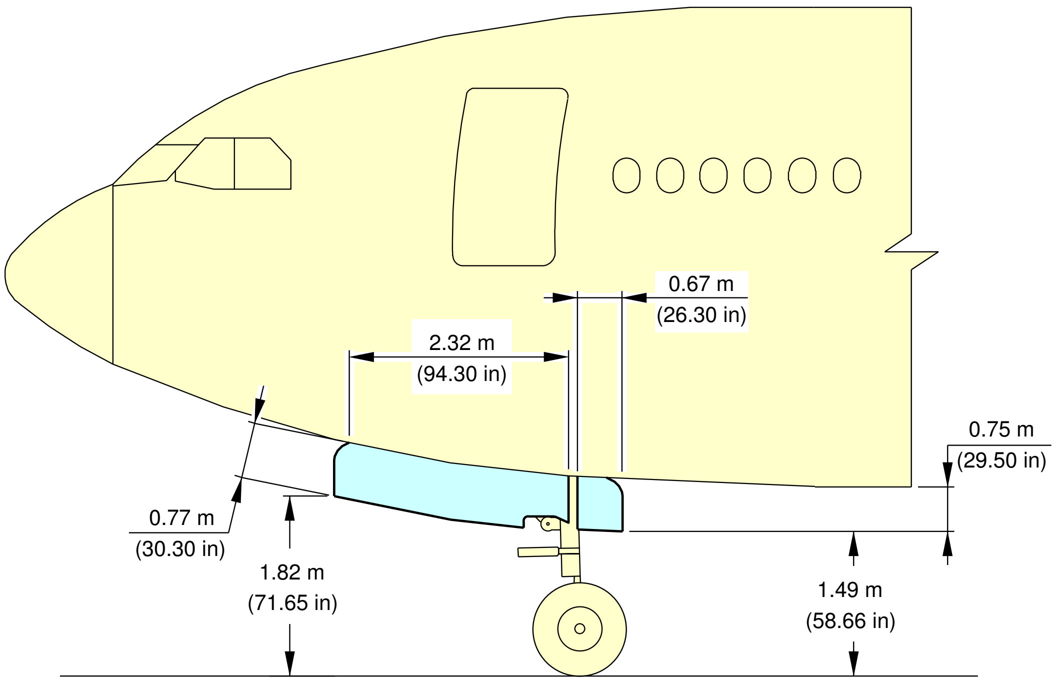
**ON A/C A330-200 A330-300

DESC 09-10-10-004-A01

Nose Landing Gear Doors

1. General
   This section gives data related to the location and clearances of the nose landing gear doors. The nose landing gear has two pair of doors, the forward NLG doors and the rear NLG doors.
2. Location and Clearances
   For the location and clearances of the nose landing gear doors, see FIGURE 09-10-10-991-010-A.

**ON A/C A330-200 A330-300



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Door Sizes and Locations
Nose Landing Gear Doors
FIGURE-09-10-10-991-010-A01

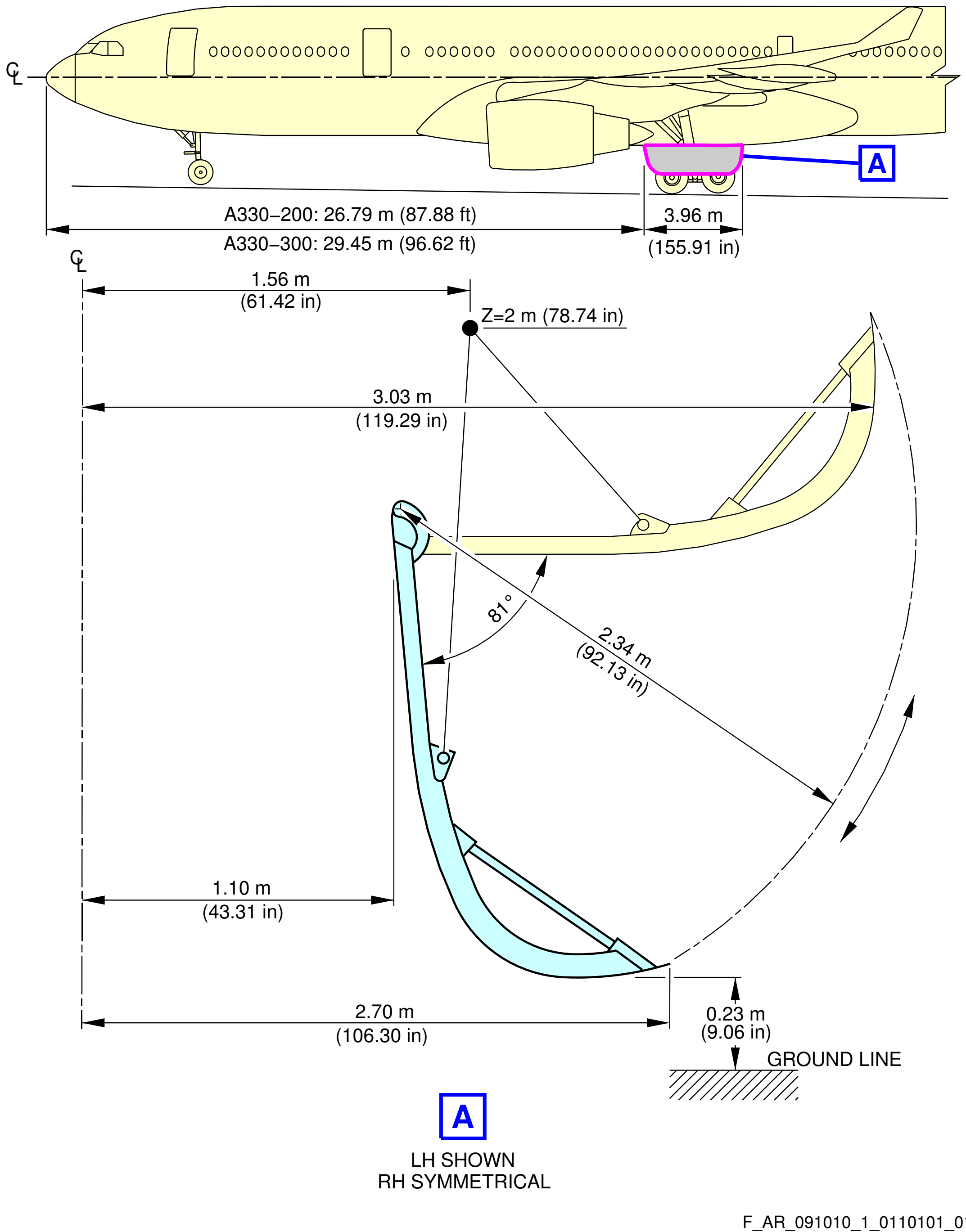
**ON A/C A330-200 A330-300

DESC 09-10-10-005-A01

Main and Center Landing Gear Doors

1. General
   This section gives data related to the location and clearances of the main landing gear doors, see FIGURE 09-10-10-991-011-A.

**ON A/C A330-200 A330-300



Location and Clearances
Main Landing Gear Doors
FIGURE-09-10-10-991-011-A01

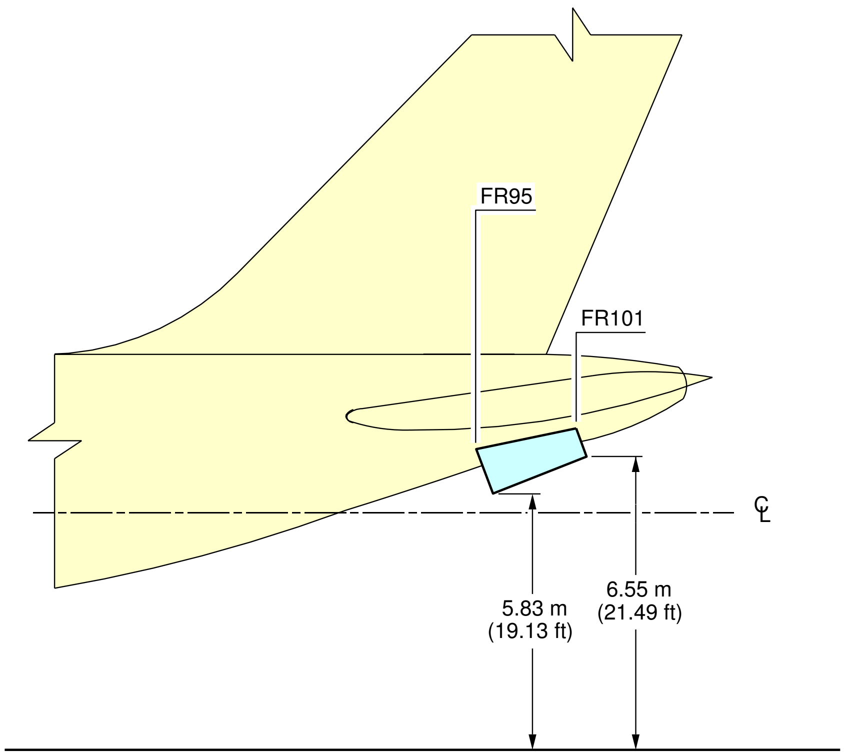
****ON A/C A330-200 A330-300**

DESC 09-10-10-006-A01

APU Doors

1. General
   This section gives data related to the location and clearances of the APU doors.
2. Location and Clearances
   For the location and clearances of the APU doors see FIGURE 09-10-10-991-014-A.

**ON A/C A330-200 A330-300



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Location and Clearances
APU Doors
FIGURE-09-10-10-991-014-A01

09-10-11 AIRCRAFT GROUND CLEARANCES

**ON A/C A330-200 A330-300

DESC 09-10-11-001-A01

General

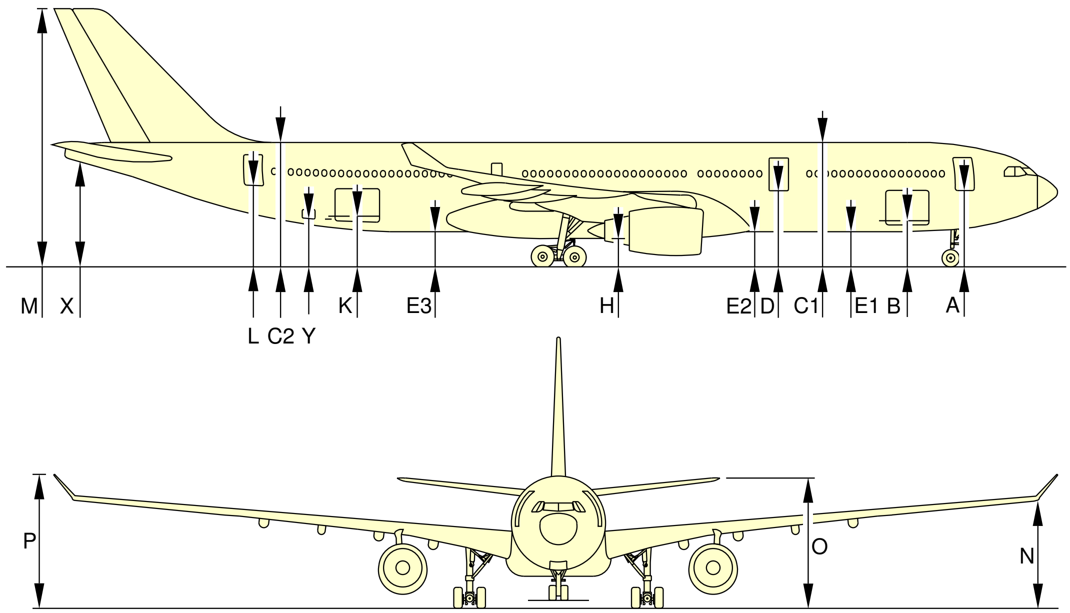
1. This section gives the height of various points of the aircraft, above the ground, for different aircraft configurations.
   Dimensions in the tables are approximate and will vary with tire type, W&B and others special conditions.

   The dimensions are given for:
   - the basic aircraft OWE with a mid CG,
   - the MRW for the highest weight variant with a FWD CG and a AFT CG,
   - the MRW for the heaviest weight variant with a FWD CG and a AFT CG,
   - aircraft on jacks, FDL at 6.5 m (21.33 ft).

   NOTE : Passenger and cargo door ground clearances are measured from the center of the door sill and from floor level.

   For the ground clearances of the:
   - Basic ground clearances, see FIGURE 09-10-11-991-001-A.
   - Extended leading edge slats, see FIGURE 09-10-11-991-002-A.
   - Extended trailing edge flaps, see FIGURE 09-10-11-991-003-A.
   - Extended spoilers, see FIGURE 09-10-11-991-004-A.
   - Ailerons in the down position, see FIGURE 09-10-11-991-005-A.
   - Ailerons in the up position, see FIGURE 09-10-11-991-006-A.
   - Flap tracks with the flaps extended, see FIGURE 09-10-11-991-007-A.

**ON A/C A330-200 A330-300



	HEIGHT FROM GROUND	
	m	ft
A	4.41	14.46
A	2.55	8.36
C1	7.58	24.86
C2	8.31	27.26
D	4.67	15.32
E1	1.95	6.39
E2	2.10	6.88
E3	2.54	8.33
H	1.86	6.10

	HEIGHT FROM GROUND	
	m	ft
K	3.22	10.56
L	5.55	18.20
M	16.94	55.58
N	6.13	20.11
O	8.09	26.54
P	7.70	25.56
X	7.24	23.76
Y	3.46	11.35

NOTE: THE DISTANCES GIVEN IN THE GROUND CLEARANCES CHARTS ARE REFERENCE DISTANCES CALCULATED FOR A/C WEIGHT AND CG CONDITIONS
THE CONDITIONS USED IN THE CALCULATIONS ARE MAXIMUM A/C WEIGHT (MINIMUM GROUND CLEARANCES) AND A TYPICAL A/C MAINTENANCE WEIGHT (TYPICAL GROUND CLEARANCES FOR MAINTENANCE)
PASSENGER AND CARGO DOOR CLEARANCES ARE MEASURED FROM THE CENTER OF THE DOOR SILL AND FROM FLOOR LEVEL.

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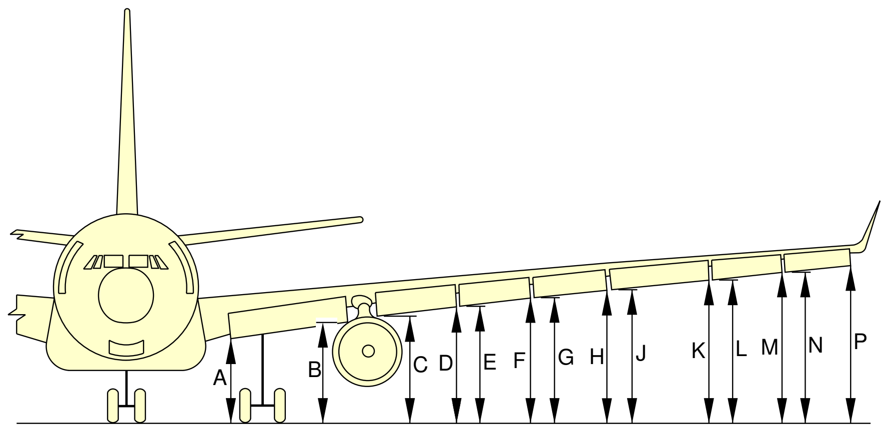
Aircraft Ground Clearances
Basic Ground Clearances
FIGURE-09-10-11-991-001-A01

**ON A/C A330-200 A330-300



	HEIGHT FROM GROUND	
	m	ft
A	3.46	11.35
B	4.25	13.94
C	4.28	14.04
D	4.65	15.26
E	4.65	15.26
F	4.99	16.37
G	4.99	16.37

	HEIGHT FROM GROUND	
	m	ft
H	5.30	17.39
J	5.37	17.62
K	5.65	18.54
L	5.65	18.54
M	5.91	19.39
N	5.91	19.39
P	6.16	20.21

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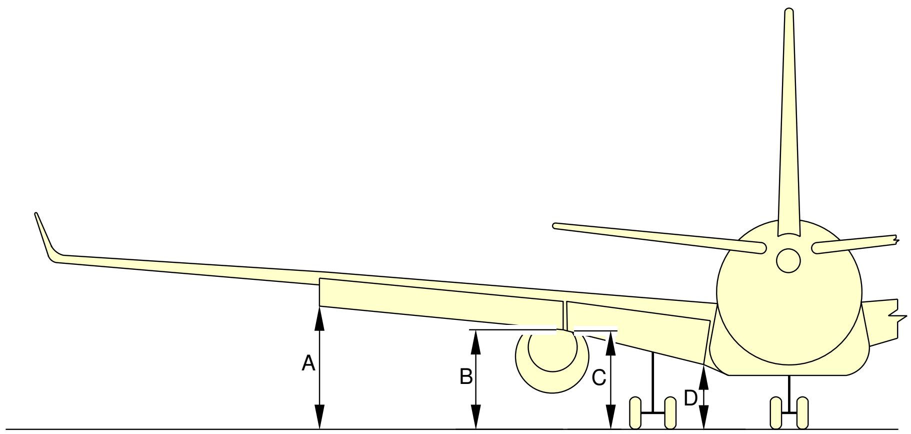
Aircraft Ground Clearances
Leading Edge Slats - Extended
FIGURE-09-10-11-991-002-A01

**ON A/C A330-200 A330-300



	HEIGHT FROM GROUND	
	m	ft
A	5.21	17.09
B	4.00	13.12
C	4.00	13.12
D	2.71	8.89

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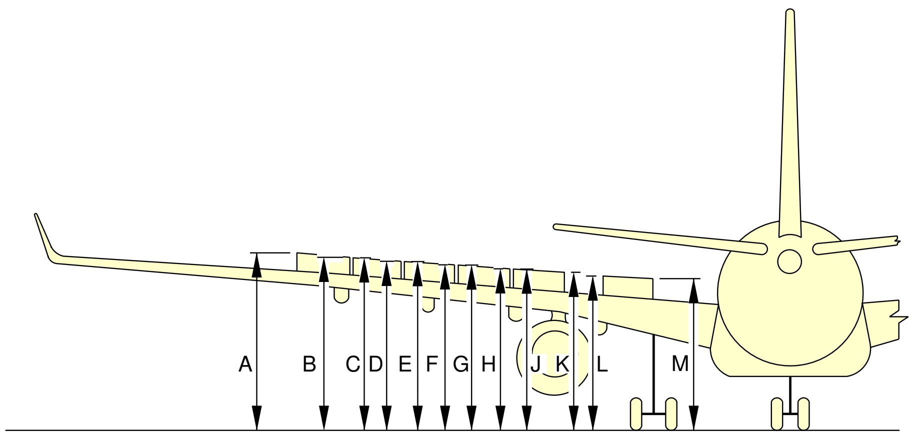
Aircraft Ground Clearances
Trailing Edge Flaps - Extended
FIGURE-09-10-11-991-003-A01

**ON A/C A330-200 A330-300



	HEIGHT FROM GROUND	
	m	ft
A	6.60	21.65
B	6.44	21.13
C	6.44	21.13
D	6.29	20.64
E	6.29	20.64
F	6.12	20.08

	HEIGHT FROM GROUND	
	m	ft
G	6.12	20.08
H	5.93	19.46
J	5.93	19.46
K	5.72	18.77
L	5.31	17.42
M	4.76	15.62

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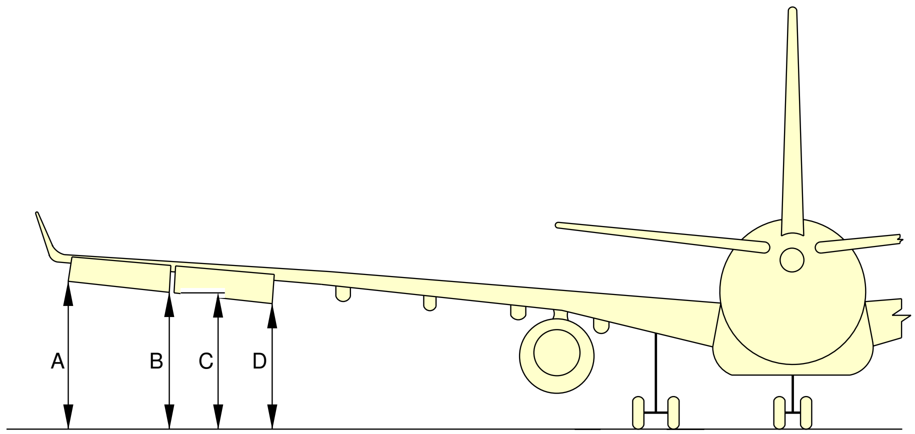
Aircraft Ground Clearances
Spoilers - Extended
FIGURE-09-10-11-991-004-A01

**ON A/C A330-200 A330-300



	HEIGHT FROM GROUND	
	m	ft
A	6.30	20.67
B	5.83	19.13
C	5.83	19.13
D	5.47	17.95

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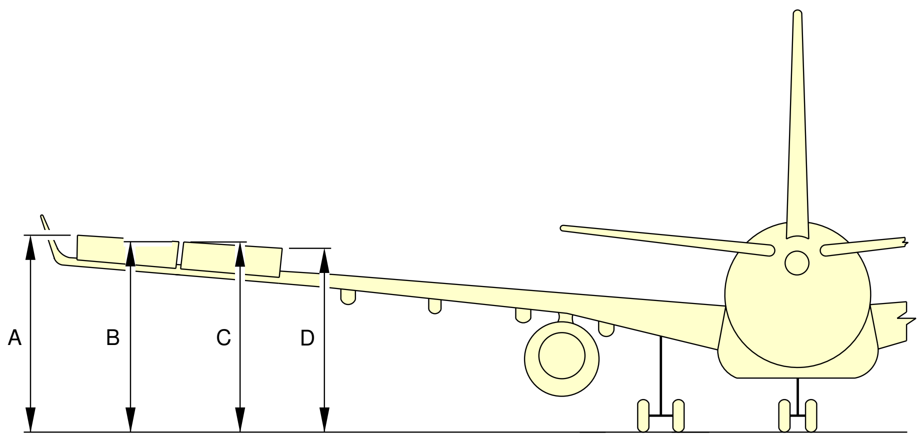
Aircraft Ground Clearances
Ailerons - Down
FIGURE-09-10-11-991-005-A01

**ON A/C A330-200 A330-300



	HEIGHT FROM GROUND	
	m	ft
A	6.85	22.47
B	6.58	21.59
C	6.58	21.59
D	6.38	20.93

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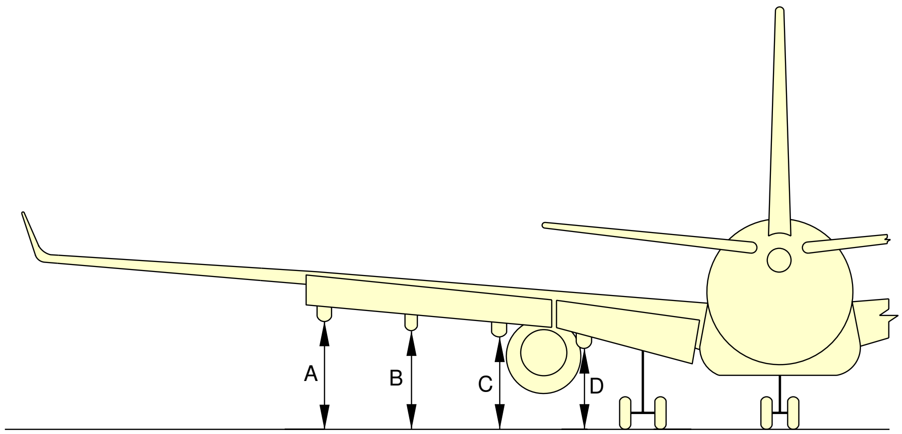
Aircraft Ground Clearances
Ailerons - Up
FIGURE-09-10-11-991-006-A01

**ON A/C A330-200 A330-300



	HEIGHT FROM GROUND	
	m	ft
A	4.08	13.39
B	3.73	12.24
C	3.48	11.42
D	2.95	9.68

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Aircraft Ground Clearances
Flap Track Fairings - Flaps Extended
FIGURE-09-10-11-991-007-A01

09-10-12 AIRCRAFT GROUND SERVICE CONNECTIONS

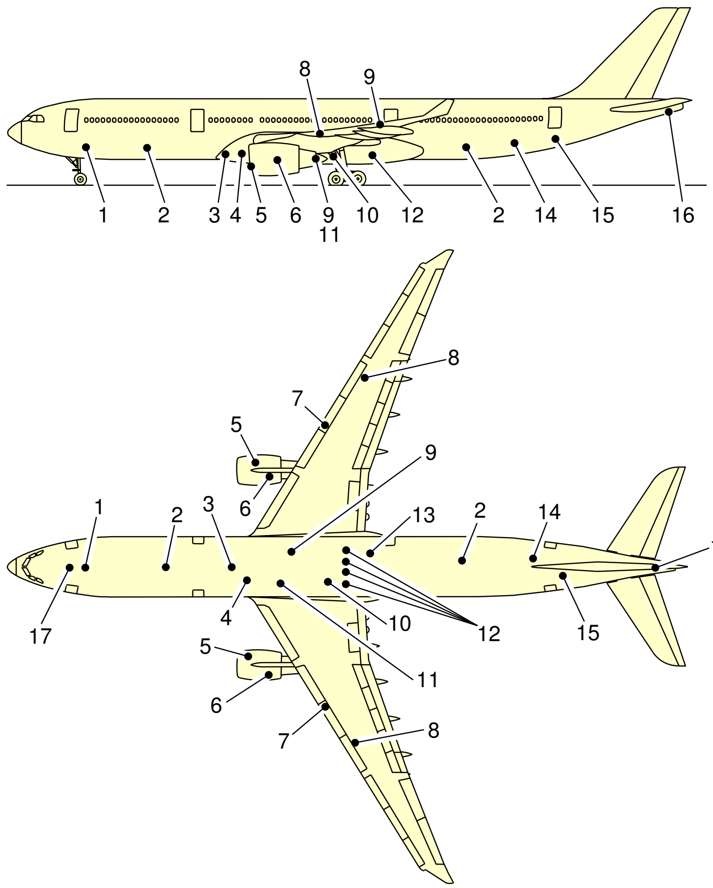
****ON A/C A330-200 A330-300**

DESC 09-10-12-001-A01

General

1. This chapter gives data about the ground service connections of the aircraft.
   See FIGURE 09-10-12-991-001-A for the ground service connections general layout.
   This chapter gives data about the systems that follow:
   - Hydraulic System, see DESC 09-10-12-002-A01,
   - Electrical System, see DESC 09-10-12-003-A01,
   - Fuel System, see DESC 09-10-12-004-A01,
   - Potable Water System, see DESC 09-10-12-005-A01,
   - Waste Water Disposal System, see DESC 09-10-12-006-A01.

**ON A/C A330-200 A330-300



1 – EXTERNAL POWER PANEL
2 – REMOTE WATER DRAIN
3 – LOW PRESSURE AIR GROUND CONNECTOR
4 – HIGH PRESSURE AIR GROUND CONNECTORS FOR ENGINE STARTING
5 – IDG OIL FILLING
6 – ENGINE OIL FILLING
7 – PRESSURE REFUEL/DEFUEL COUPLING
8 – OVERWING REFUEL COUPLING
9 – YELLOW GROUND CONNECTOR
10 – GREEN GROUND CONNECTOR
11 – BLUE GROUND CONNECTOR
12 – AIR CHARGING FOR HYDRAULIC ACCUMULATORS
13 – REFUEL/DEFUEL CONTROL PANEL
14 – POTABLE WATER SERVICE PANEL
15 – WASTE SERVICE PANEL
16 – APU OIL FILLING

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Ground Service Connections
General Layout
FIGURE-09-10-12-991-001-A01

**ON A/C A330-200 A330-300

DESC 09-10-12-002-A01

Hydraulic System

1. Access
This section gives data related to the location of the ground service connections.

Access	Position from Aft of Nose	Position from Aircraft Centerline		Height from Ground
		LH Side	RH Side	
Green Hydraulic Ground Service Panel Access Door 197CB	41.30 m (135.49 ft)	1.34 m (4.39 ft)	-	2.23 m (7.31 ft)
Yellow Hydraulic Ground Service Panel Access Door 196BB	35.40 m (116.14 ft)	-	1.30 m (4.26 ft)	1.95 m (6.39 ft)
Blue Hydraulic Ground Service Panel Access Door 195BB	34.41 m (112.89 ft)	1.28 m (4.19 ft)	-	1.94 m (6.36 ft)

Ground Service Panels

TABLE 1

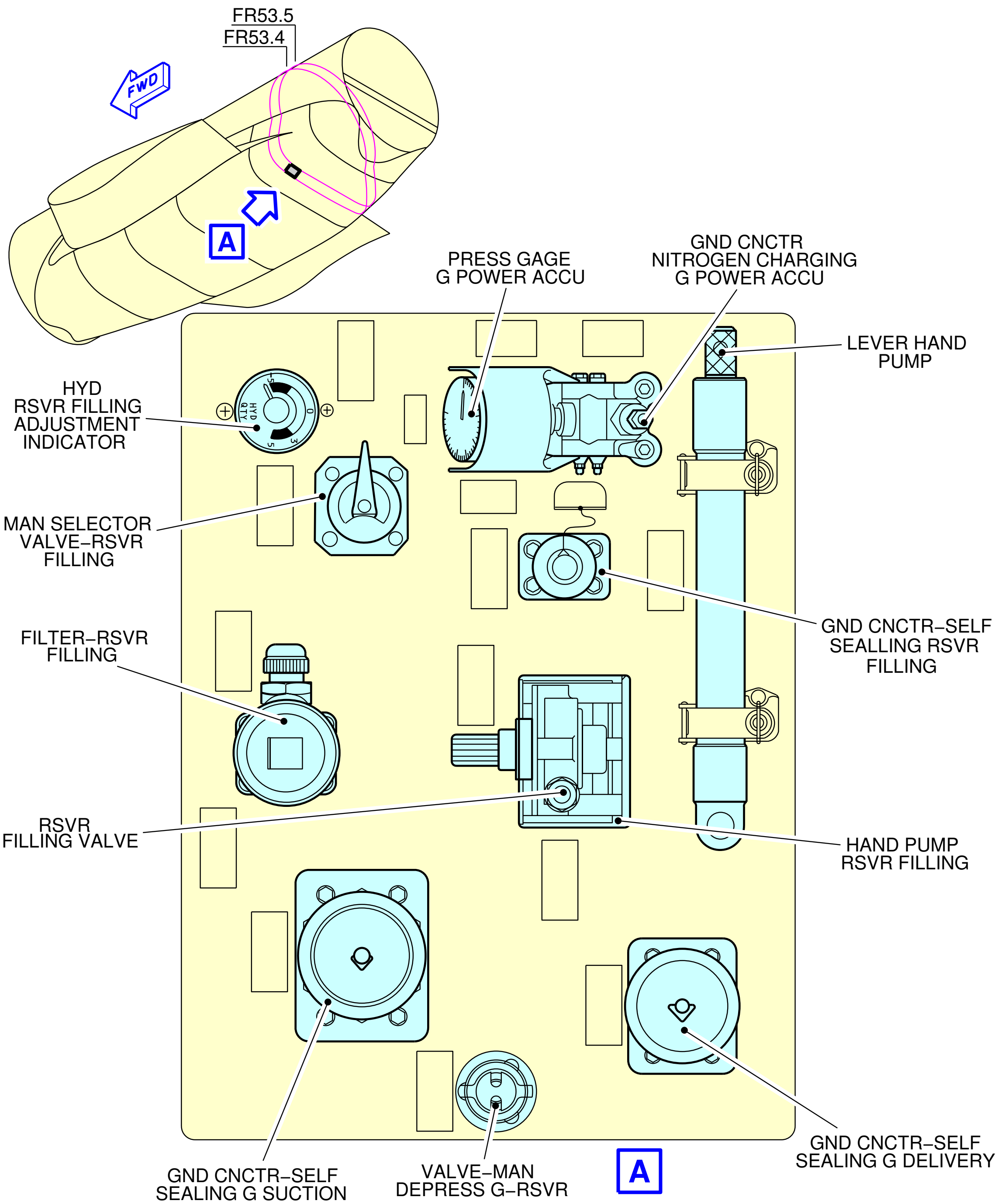
NOTE : Distances are approximate.

2. Technical Specifications
This section gives data related to the specifications of the ground service connections.

A. Ground Test
Reservoir Pressurization
On each ground service panel:
- One Connector AE96997M (delivery).
- One Connector AE96996P (suction).

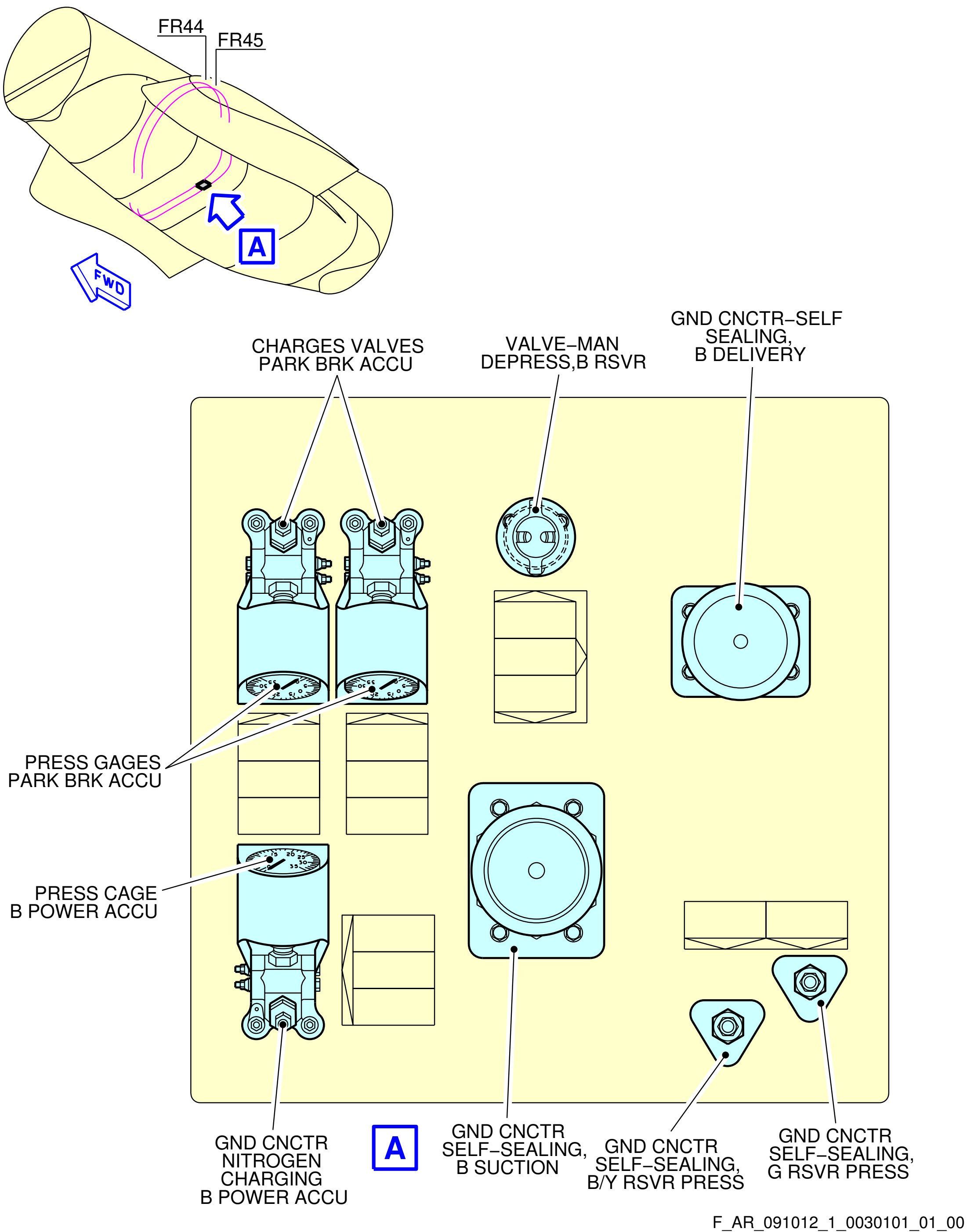
B. Reservoir Filling
On the Green system ground service panel:
- One Connector AE96993E, for pressurized supply.
- One handpump filling connection for unpressurized (suction) supply.

**ON A/C A330-200 A330-300



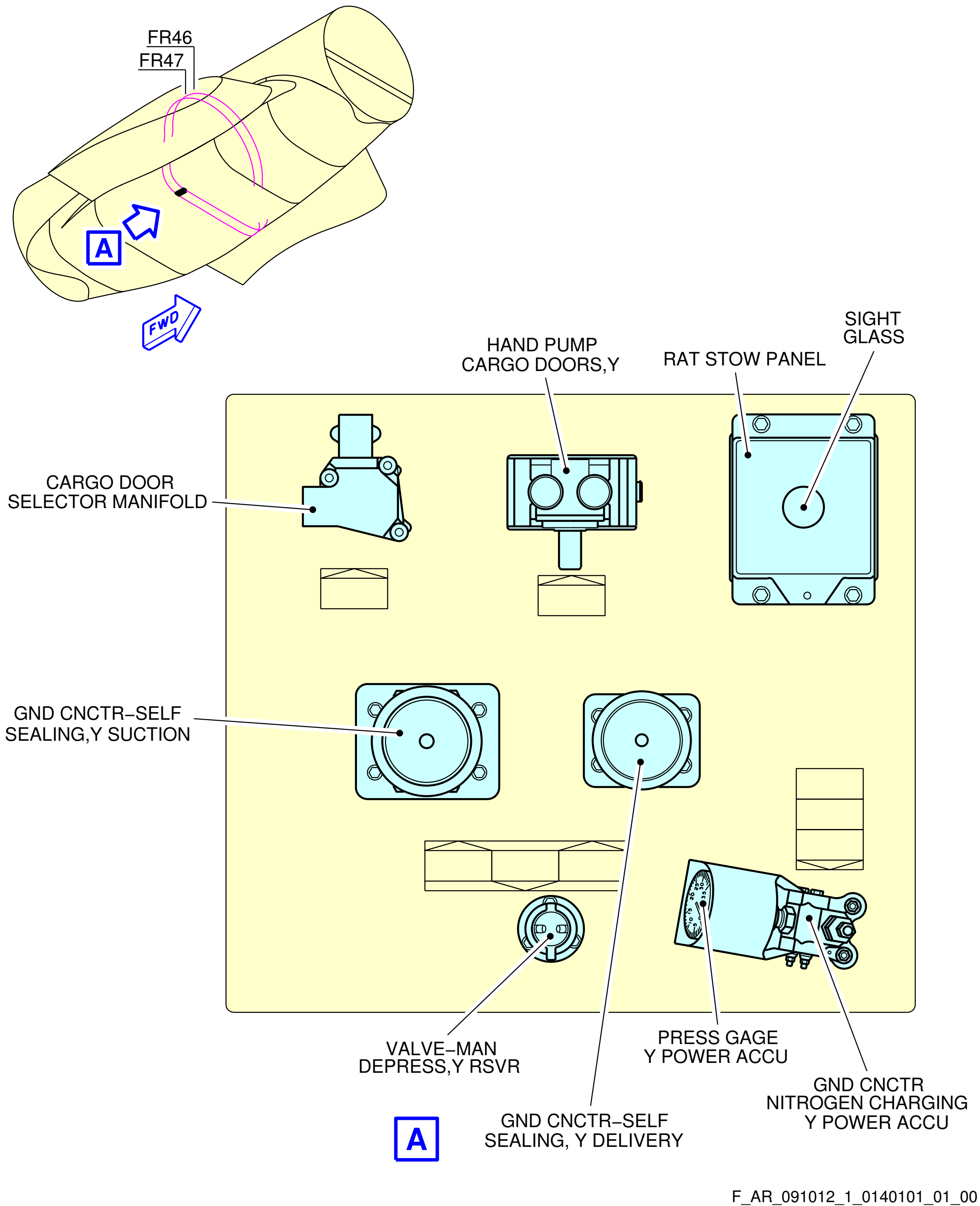
Ground Service Connections
Green System Ground Service Panel
FIGURE-09-10-12-991-002-A01

**ON A/C A330-200 A330-300



Ground Service Connections
Blue System Ground Service Panel
FIGURE-09-10-12-991-003-A01

**ON A/C A330-200 A330-300



Ground Service Connections
Yellow System Ground Service Panel
FIGURE-09-10-12-991-014-A01

****ON A/C A330-200 A330-300**

DESC 09-10-12-003-A01

Electrical System

1. Access
   This section gives data related to the location of the ground service connections.

Access	Position from Aft of Nose	Position from Aircraft Centerline		Height from Ground
		LH Side	RH Side	
External Power Receptacle Access Door 121EL	7.20 m (23.62 ft)	on centerline		1.98 m (6.49 ft)

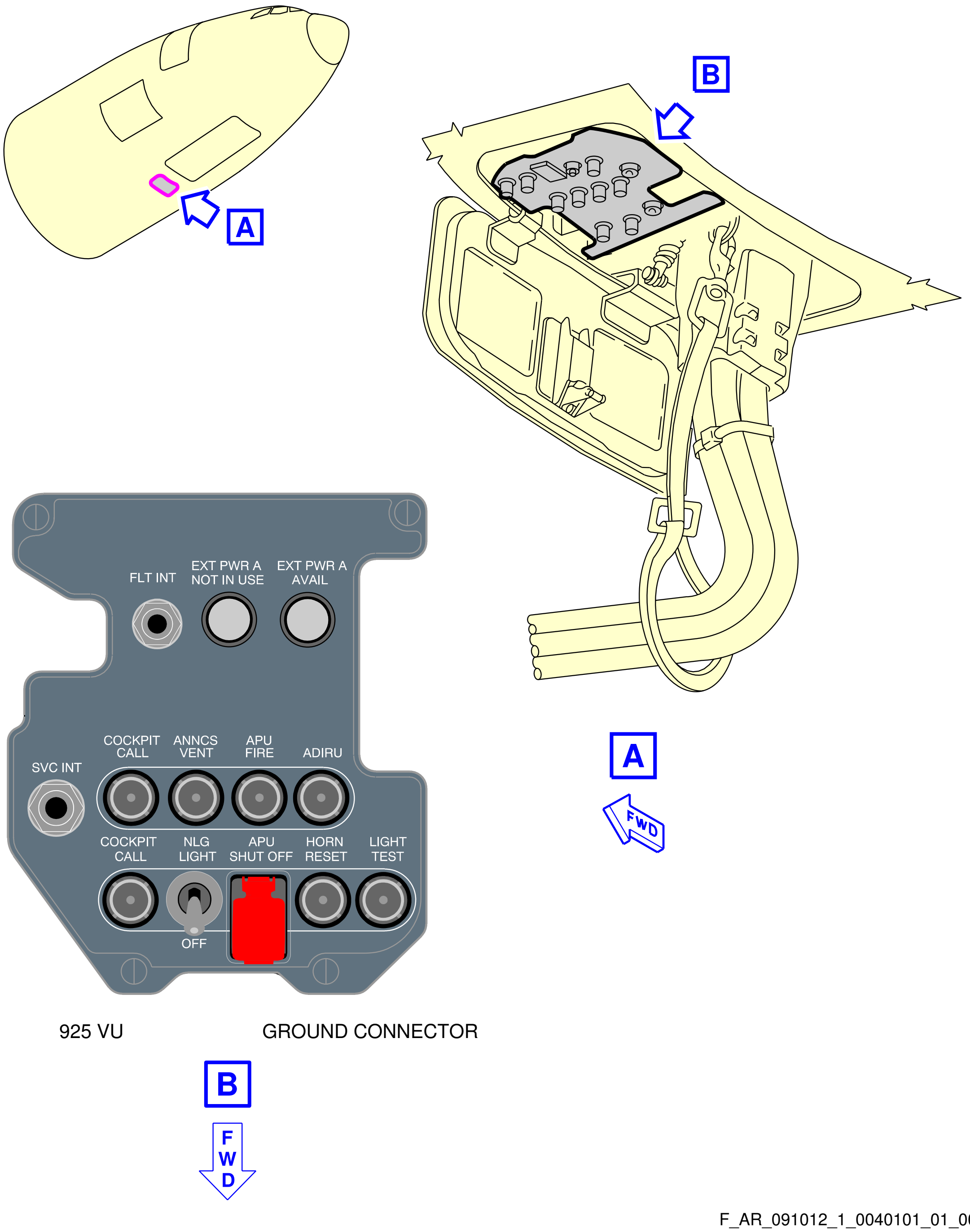
Ground Service Panels

TABLE 1

NOTE : Distances are approximate.

2. Technical Specifications
   This section gives data related to the specifications of the ground service connections.
   A. External Power Receptacles:
      - Two Standard ISO R461 Receptacles - 90 KVA each.
   B. Power Supply:
      - Three Phases, 115 V, 400 Hz.
   C. Electrical Connectors for Servicing:
      - AC Outlets: HUBBEL 5258.
      - DC Outlets: HUBBEL 7472.
      - Vacuum Cleaner Outlets: HUBBEL 5258.

**ON A/C A330-200 A330-300



Ground Service Connections
External Power Receptacles
FIGURE-09-10-12-991-004-A01

**ON A/C A330-200 A330-300

DESC 09-10-12-004-A01

Fuel System

**ON A/C A330-200

1. Access
This section gives data related to the location of the ground service connections.

Access	Position from Aft of Nose	Position from Aircraft Centerline		Height from Ground
		LH Side	RH Side	
Refuel/Defuel Integrated Panel Access Door 198DB	31.10 m (102.03 ft)	-	0.80 m (2.62 ft)	1.90 m (6.23 ft)
Refuel/Defuel Coupling, Left Access Door 522HB (Optional)	26.80 m (87.92 ft)	12.60 m (41.33 m)	-	5.00 m (16.40 ft)
Refuel/Defuel Coupling, Right Access Door 622HB	26.80 m (87.92 ft)	-	12.60 m (41.33 m)	5.00 m (16.40 ft)
Overwing gravity refuel cap	31.30 m (102.68 ft)	17.20 m (56.43 ft)	17.20 m (56.43 ft)	5.80 m (19.02 ft)

Ground Service Panels

TABLE 1

NOTE : Distances are approximate.

**ON A/C A330-300

2. Access
This section gives data related to the location of the ground service connections.

Access	Position from Aft of Nose	Position from Aircraft Centerline		Height from Ground
		LH Side	RH Side	
Refuel/Defuel Integrated Panel Access Door 198DB	34.30 m (112.53 ft)	-	0.80 m (2.62 ft)	1.90 m (6.23 ft)
Refuel/Defuel Coupling, Left Access Door 522HB (Optional)	30.00 m (98.45 ft)	12.60 m (41.33 m)	-	5.00 m (16.40 ft)

Access	Position from Aft of Nose	Position from Aircraft Centerline		Height from Ground
		LH Side	RH Side	
Refuel/Defuel Coupling, Right Access Door 622HB	30.00 m (98.45 ft)	-	12.60 m (41.33 ft)	5.00 m (16.40 ft)
Overwing gravity refuel cap	34.50 m (113.18 ft)	17.20 m (56.43 ft)	17.20 m (56.43 ft)	5.80 m (19.02 ft)

Ground Service Panels

TABLE 2

NOTE : Distances are approximate.

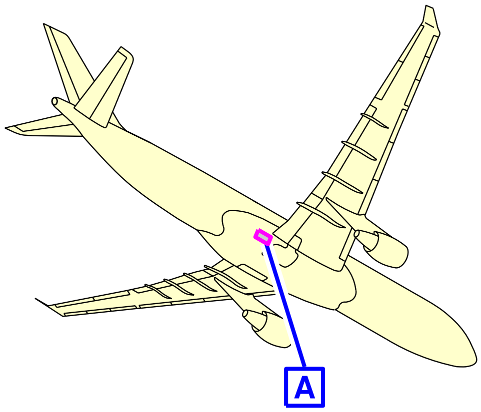
****ON A/C A330-200**

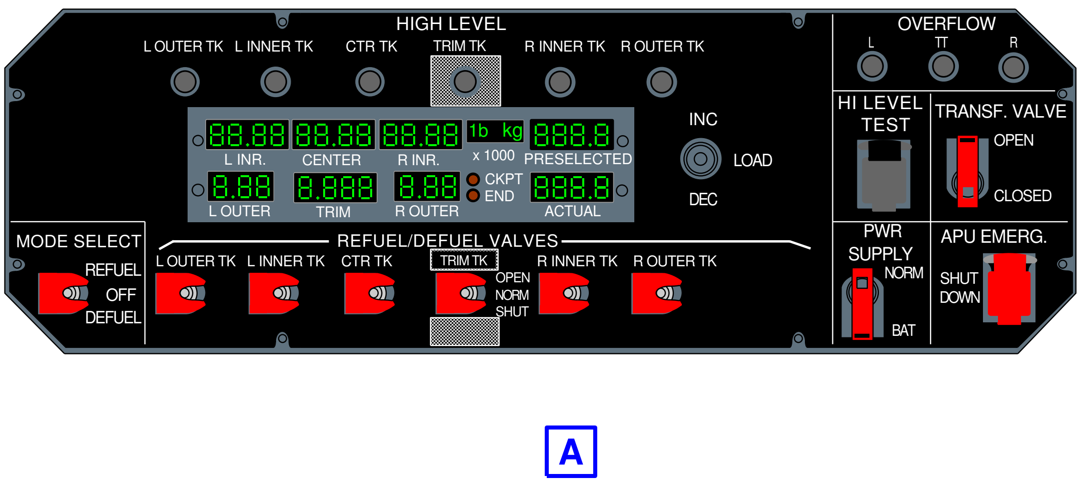
3. Technical Specifications
   This section gives data related to the specifications of the ground service connections.
   A. Refuel/Defuel Couplings:
      - Right wing: two standard ISO R45, 2.5 in.
      - Left wing: two standard ISO R45, 2.5 in.
   B. Refuel Pressure:
      - Max. pressure: 3.45 bar (50 psi).
   C. Refuel Flow:
      - 1580 l/minute (417 U.S gal/minute) per connection.

****ON A/C A330-300**

4. This section gives data related to the specifications of the ground service connections.
   A. Refuel/Defuel Couplings:
      - Right wing: two standard ISO R45, 2.5 in.
      - Left wing: two optional standard ISO R45, 2.5 in.
   B. Refuel Pressure:
      - Max. pressure: 3.45 bar (50 psi).
   C. Refuel Flow:
      - 1580 l/minute (417 U.S gal/minute) per connection.

**ON A/C A330-200 A330-300





NOTE: DEPENDING ON A/C CONFIGURATION

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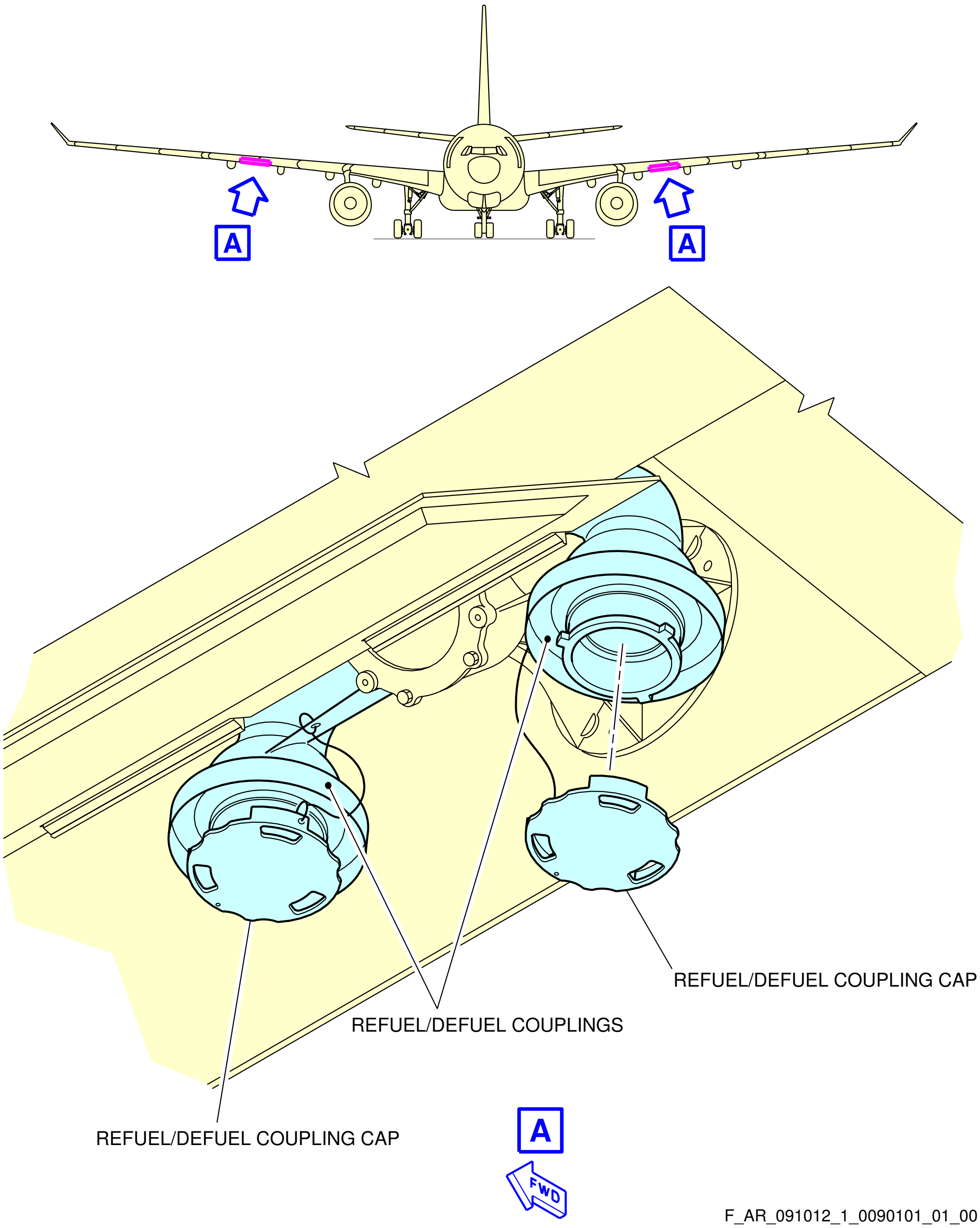
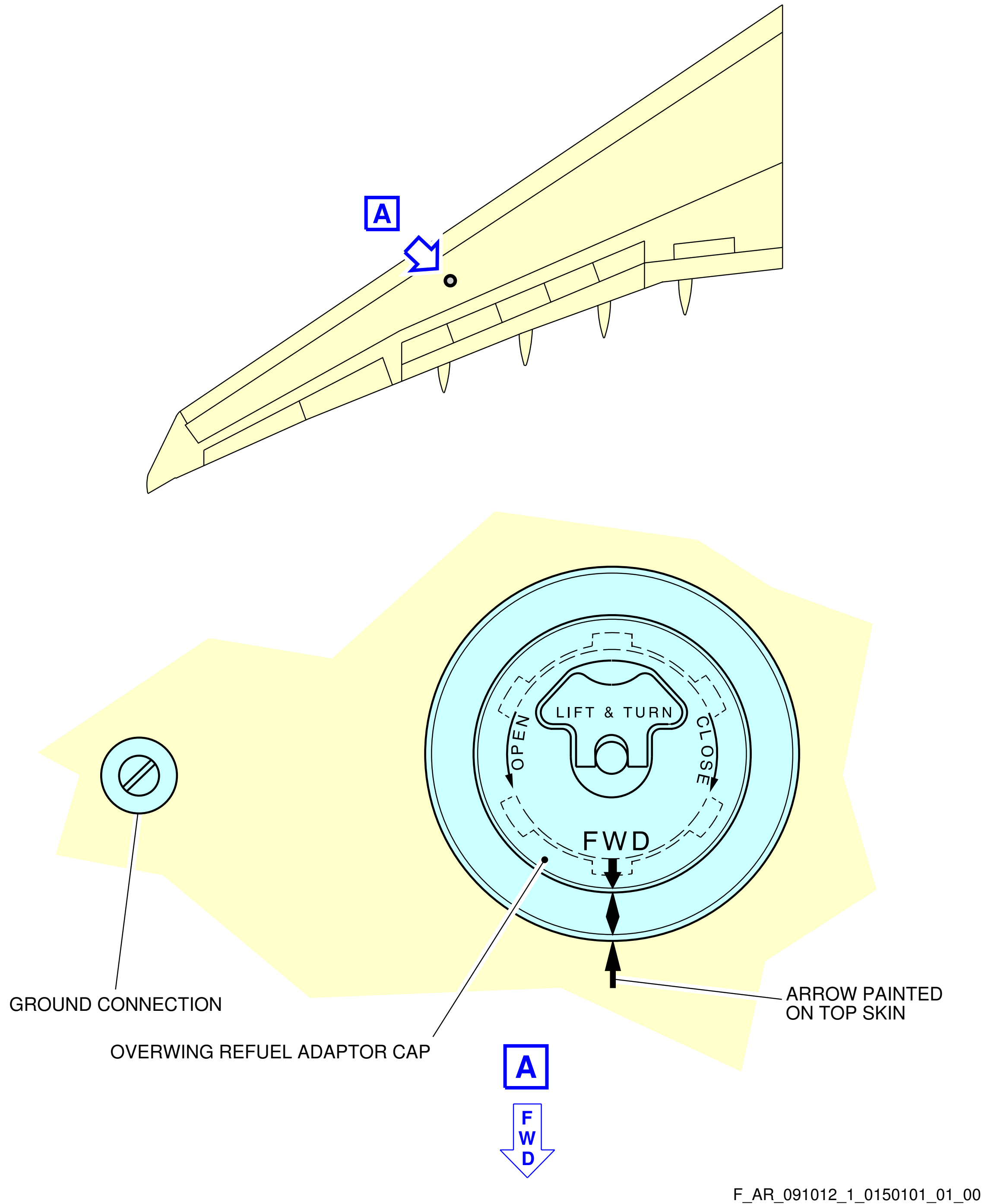
Ground Service Connections
Refuel/Defuel Panel
FIGURE-09-10-12-991-008-A01

**ON A/C A330-200 A330-300



Ground Service Connections
Refuel/Defuel Couplings
FIGURE-09-10-12-991-009-A01

**ON A/C A330-200 A330-300



Ground Service Connections
Gravity Refuel Couplings
FIGURE-09-10-12-991-015-A01

****ON A/C A330-200 A330-300**

DESC 09-10-12-005-A01

Potable Water System

1. Access
This section gives data related to the location of the ground service connections.

Access	Position from Aft of Nose	Position from Aircraft Centerline		Height from Ground
		LH Side	RH Side	
Potable Water Ground Service Panel Access Door 164AR	48.15 m (157.97 ft)	-	0.51 m (1.67 ft)	3.15 m (10.33 ft)
Drain Panel Access Door 133BL	14.70 m (48.22 ft)	0.60 m (1.96 ft)	-	1.90 m (6.23 ft)
Drain Panel Access Door 154AR	40.18 m (131.82 ft)	-	0.72 m (2.36 ft)	2.46 m (8.07)

Ground Service Panels

TABLE 1

NOTE : Distances are approximate.

2. Technical Specifications
This section gives data related to the specifications of the ground service connections.

A. Connections

(1) On the ground service panel (Access Door 164AR):
- One heated 3/4 in. quick release filling connection.
- One heated 3/4 in. overflow and discharge connection.
- One ground pressurization connection.

(2) On drain panel (Access Door 133BL):
- One standard 3/4 in. drain connection with back-up mechanical control.

(3) On drain panel (Access Door 154AR):
- One standard 3/4 in. drain connection with back-up mechanical control.
- One standard 3/4 in. overflow and discharge connection with back-up mechanical control.

B. Capacity
- 700 l (185 US gal) standard.
- 1050 l (277 US gal) standard option.

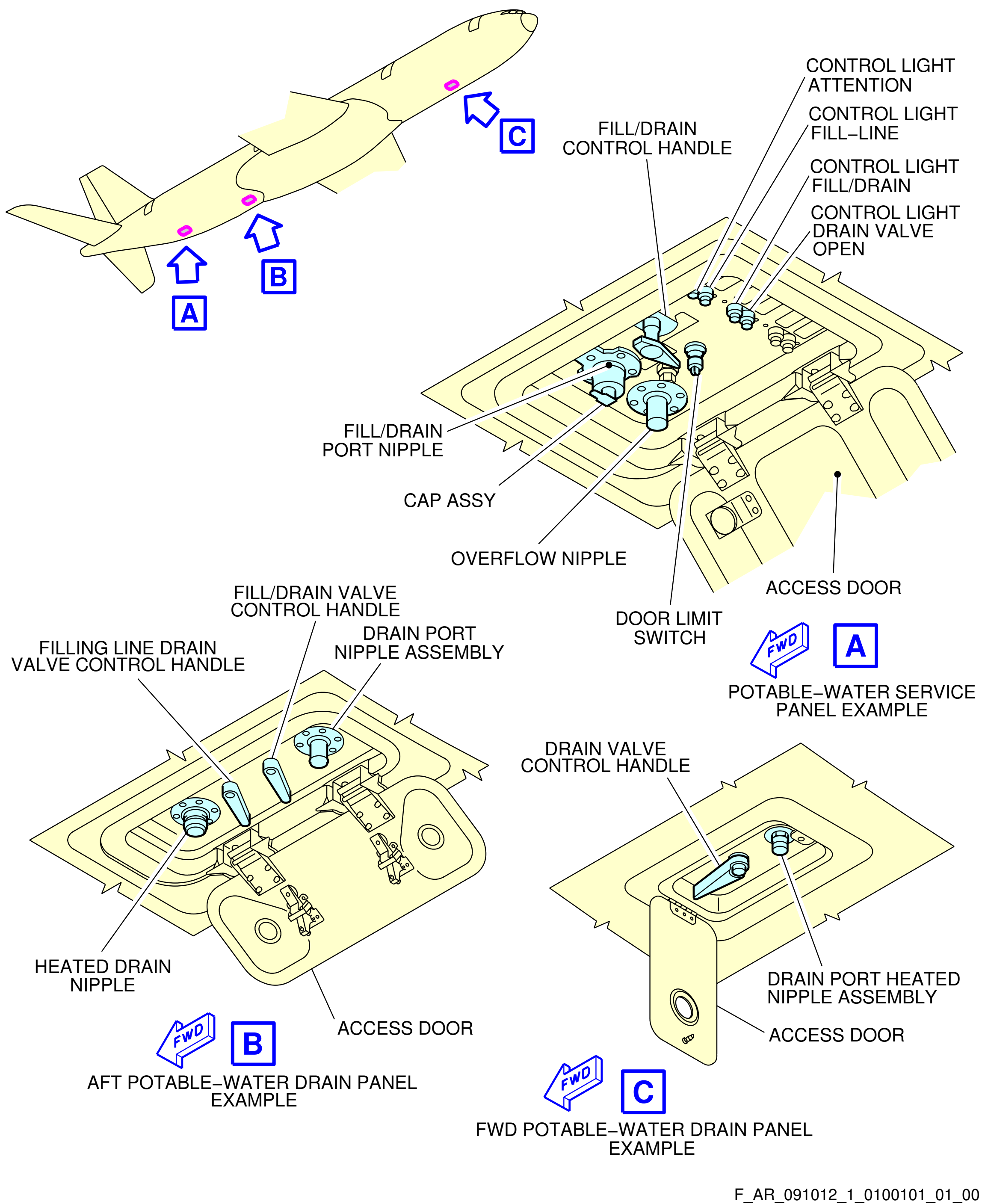
C. Filling Pressure
Fwd-tank

- Filling Pressure : 3.45/8.61 bar (50/125 psi).
- Flow rate: 45/73 l/minute (12/19 US gal/minute).

Aft-tank

- Filling Pressure : 3.45/8.61 bar (50/125 psi).
- Flow rate: 56/85 l/minute (15/22 US gal/minute).

**ON A/C A330-200 A330-300



Ground Service Connections
Potable Water Ground Service Panel
FIGURE-09-10-12-991-010-A01

****ON A/C A330-200 A330-300**

DESC 09-10-12-006-A01

Waste Water Disposal-System

1. Access
This section gives data related to the location of the ground service connections.

Access	Position from Aft of Nose	Position from Aircraft Centerline		Height from Ground
		LH Side	RH Side	
Waste Water Ground Service Panel Access Door 171AL	50.65 m (166.17 ft)	0.09 m (0.29 ft)	-	3.60 m (11.81 ft)

Ground Service Panels

TABLE 1

NOTE : Distances are approximate.

2. Technical Specifications
This section gives data related to the specifications of the ground service connections.

A. Connections
Standard
- One standard Taco type valve 4 in. drain connection.
- Two standard Roylyn 1 in. flushing connections.

Standard option
- One standard Taco type valve 4 in. drain connection.
- Three standard Roylyn 1 in. flushing and filling connections.

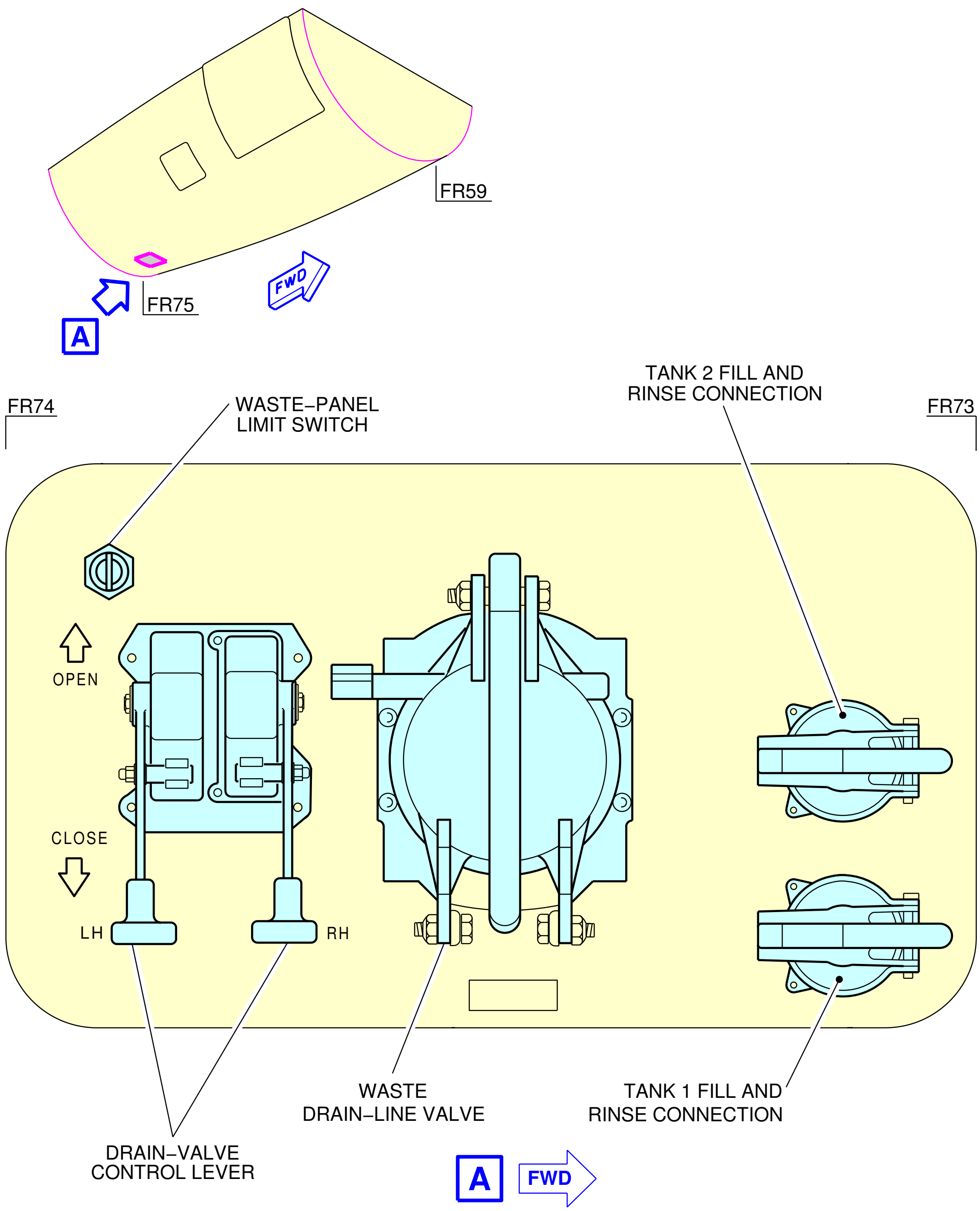
B. Capacity waste tanks
Standard
- 700 l (185 US gal).

Standard option
- 1050 l (277.38 US gal).

C. Chemical fluid
Standard
- 36 l (9.51 US gal).

Standard option
- 54 l (14.27 US gal).

**ON A/C A330-200 A330-300



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Ground Service Connections
Waste Water Ground Service Panel
FIGURE-09-10-12-991-013-A01

09-10-13 AIRCRAFT GROUNDING POINTS

****ON A/C A330-200 A330-300**

DESC 09-10-13-001-A01

Grounding Points

****ON A/C A330-200**

1. Access
This section gives data related to the location of the ground service connections.

Access	Position from Aft of Nose	Position from Aircraft Centerline		Height from Ground
		LH Side	RH Side	
NLG	6.67 m (21.88 ft)	On Centerline		1.40 m (4.59 ft)
LH MLG	28.37 m (93.08 ft)	5.34 m (17.52 ft)		1.50 m (4.92 ft)
RH MLG	28.37 m (93.08 ft)		5.34 m (17.52 ft)	1.50 m (4.92 ft)

Grounding Points Locations

TABLE 1

NOTE : Distances are approximate.

****ON A/C A330-300**

2. Access
This section gives data related to the location of the ground service connections.

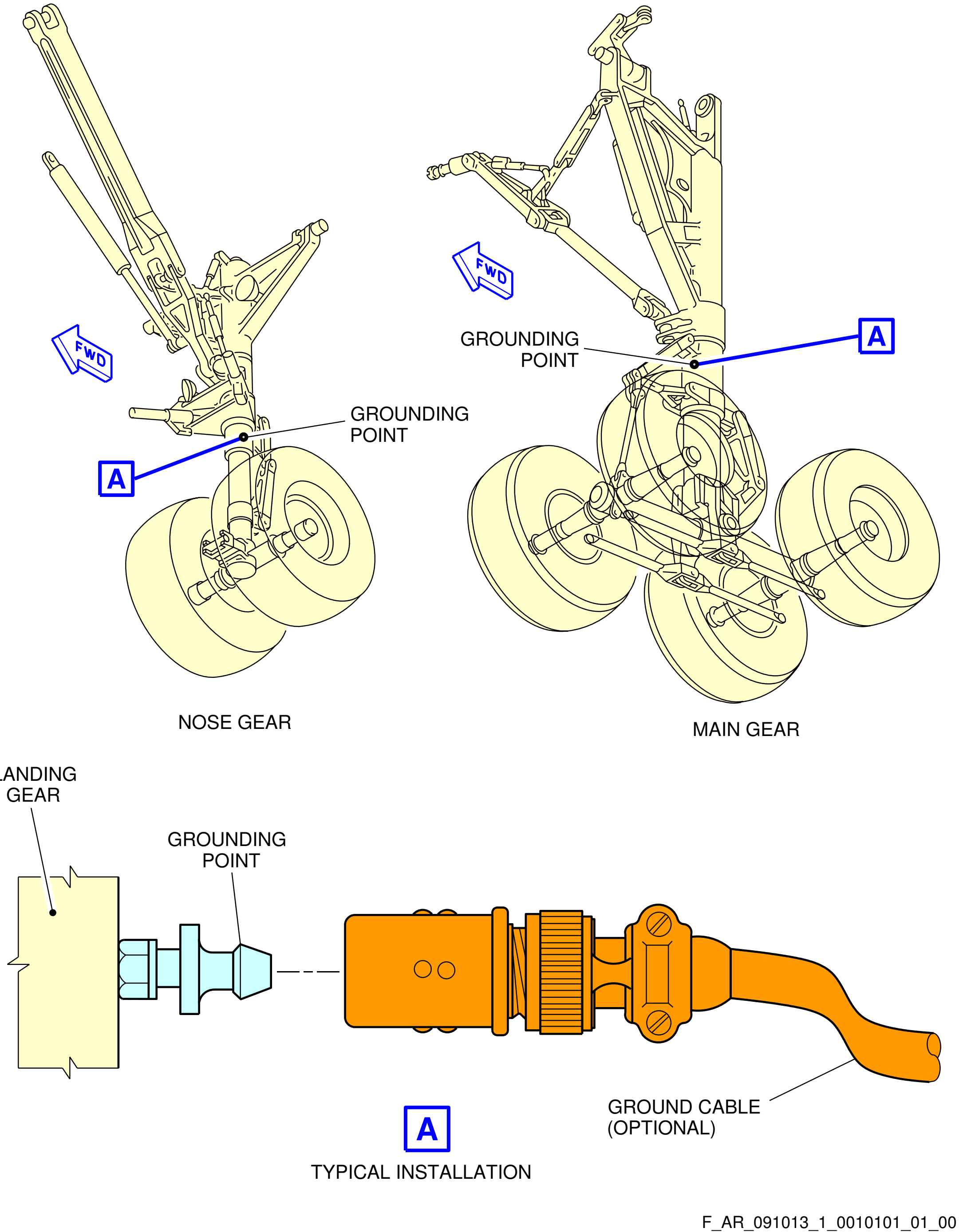
Access	Position from Aft of Nose	Position from Aircraft Centerline		Height from Ground
		LH Side	RH Side	
NLG	6.67 m (21.88 ft)	On Centerline		1.40 m (4.59 ft)
LH MLG	31.53 m (103.44 ft)	5.34 m (17.52 ft)		1.50 m (4.92 ft)
RH MLG	31.53 m (103.44 ft)		5.34 m (17.52 ft)	1.50 m (4.92 ft)

Grounding Points Locations

TABLE 2

NOTE : Distances are approximate.

**ON A/C A330-200 A330-300



Grounding Point
Location
FIGURE-09-10-13-991-001-A01

09-10-14 CARGO COMPARTMENTS

****ON A/C A330-200 A330-300**

DESC 09-10-14-001-A01

General

****ON A/C A330-200**

1. This chapter gives data related to the location, dimensions and load capacity of the different cargo compartments according to the Standard Layout. The lower deck of the aircraft has three cargo compartments, the compartments are given in the sections that follow:
   - For the Forward Cargo Compartment, see DESC 09-10-14-002-A01.
   - For the Aft Cargo Compartment, see DESC 09-10-14-003-A01.
   - For the Bulk Cargo Compartment, see DESC 09-10-14-004-A01.

   The forward and aft cargo compartments can have different types of Unit Load Devices (ULDs) loaded. The bulk cargo compartment, Standard Layout, does not have ULDs loaded but has luggage and/or bulk cargo. The total load capacity of the three cargo compartments is a maximum of 37 578 kg (82 845.3 lb) and a
   - containerized and bulk volume of: 136.03 m^3 (4 803.85 ft^3), or
   - palletized and bulk volume of: 111.9 m^3 (3 951.71ft^3).

   NOTE : See your customized WBM for accurate data related to the aircraft configuration.
   The different types of ULDs that are normally loaded are:
   - Half size (60.4 in x 61.4 in), maximum gross weight - 1 587 kg (3 500 lb).
   - Full size (60.4 in x 125 in), maximum gross weight - 3 174 kg (7 000 lb).
   - Pallet (88 in x 125 in), maximum gross weight - 4 626 kg (10 200 lb).
   - Pallet (96 in x 125 in), maximum gross weight - 5 103 kg (11 250 lb).

****ON A/C A330-300**

2. This chapter gives data related to the location, dimensions and load capacity of the different cargo compartments according to the Standard Layout. The lower deck of the aircraft has three cargo compartments, the compartments are given in the sections that follow:
   - For the Forward Cargo Compartment, see DESC 09-10-14-002-A01.
   - For the Aft Cargo Compartment, see DESC 09-10-14-003-A01.
   - For the Bulk Cargo Compartment, see DESC 09-10-14-004-A01.

   The forward and aft cargo compartments can have different types of Unit Load Devices (ULDs) loaded. The bulk cargo compartment, Standard Layout, does not have ULDs loaded but has luggage and/or bulk cargo. The total load capacity of the three cargo compartments is a maximum of 44 836 kg (98 846.5 lb) and a
   - containerized and bulk volume of: 162.84 m^3 (5 750.64 ft^3), or
   - palletized and bulk volume of: 134.95 m^3 (4 765.71ft^3).

   NOTE : See your customized WBM for accurate data related to the aircraft configuration.

The different types of ULDs that are normally loaded are:
- Half size (60.4 in x 61.4 in), maximum gross weight - 1 587 kg (3 500 lb).
- Full size (60.4 in x 125 in), maximum gross weight - 3 174 kg (7 000 lb).
- Pallet (88 in x 125 in), maximum gross weight - 4 626 kg (10 200 lb).
- Pallet (96 in x 125 in), maximum gross weight - 5 103 kg (11 250 lb).

**ON A/C A330-200 A330-300

DESC 09-10-14-002-A01

Forward Cargo Compartment

1. General
   This section gives data related to the location, dimensions and load capacity of the forward cargo compartment.

2. Location and Dimensions
   For the location and dimensions of the forward cargo compartment, see FIGURE 09-10-14-991-001-AFIGURE 09-10-14-991-001-B.

**ON A/C A330-200

3. Load Capacity
   The compartment has a maximum load capacity of approximately 18 869 kg (41 600 lb).
   The usable cargo volume for the different ULD are:
   - Usable containerized volume of approximately - 62.6 m^3 (2 212 ft^3), based on an LD3 container of - 4.47 m^3 (158 ft^3).
   - Usable palletized volume of approximately - 46.1 m^3 (1 628 ft^3), based on a 96 x 125 inch pallet of - 11.52 m^3 (407 ft^3), loaded to a height of 1.62 m (5.3 ft).

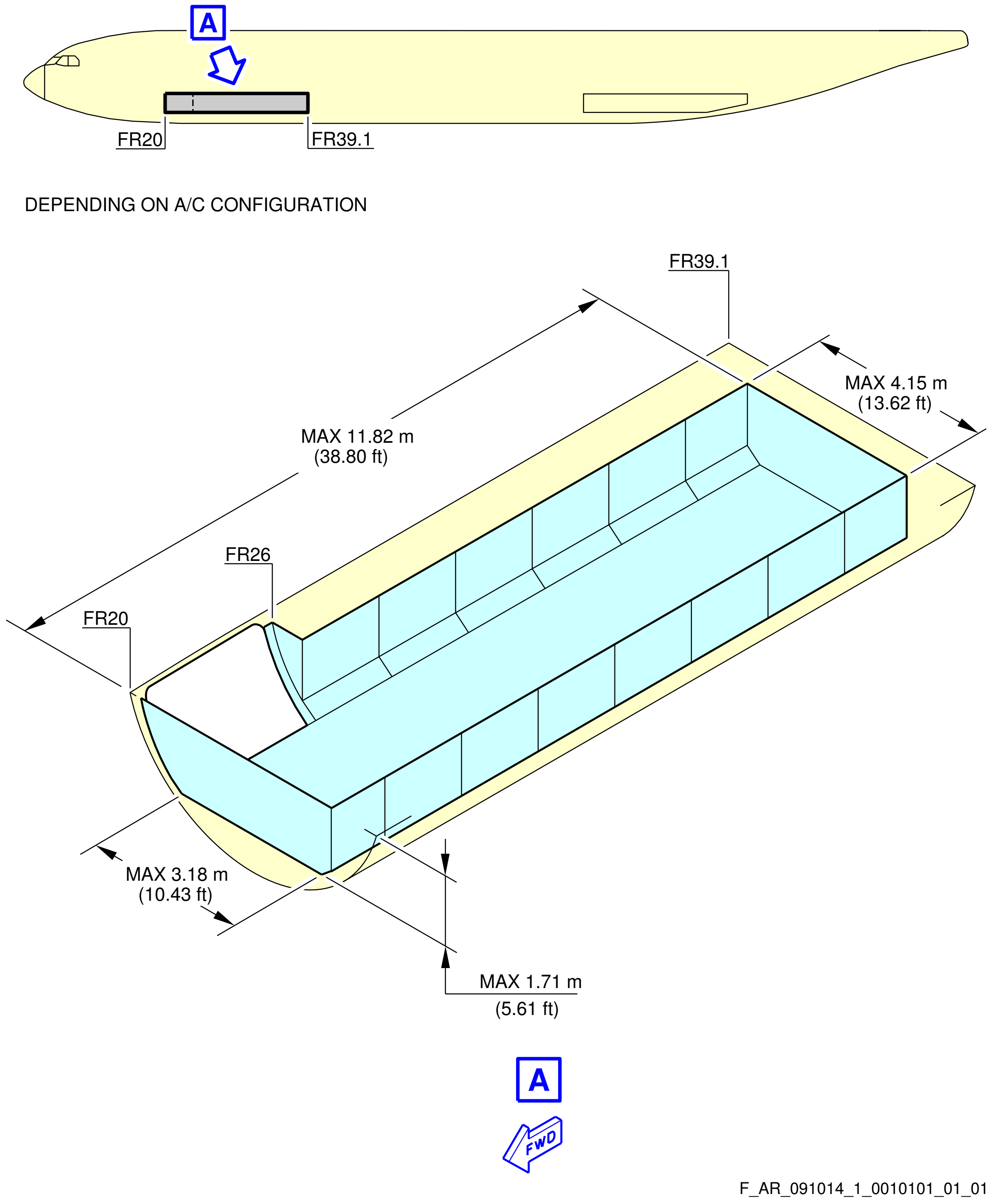
   NOTE : See your customized WBM for accurate data related to the aircraft configuration.

**ON A/C A330-300

4. Load Capacity
   The compartment has a maximum load capacity of approximately 22 861 kg (50 400 lb).
   The usable cargo volume for the different ULD are:
   - Usable containerized volume of approximately - 80.5 m^3 (2 844 ft^3), based on an LD3 container of - 4.47 m^3 (158 ft^3).
   - Usable palletized volume of approximately - 69.15 m^3 (2 442 ft^3), based on a 96 x 125 inch pallet of - 11.52 m^3 (407 ft^3), loaded to a height of 1.62 m (5.3 ft).

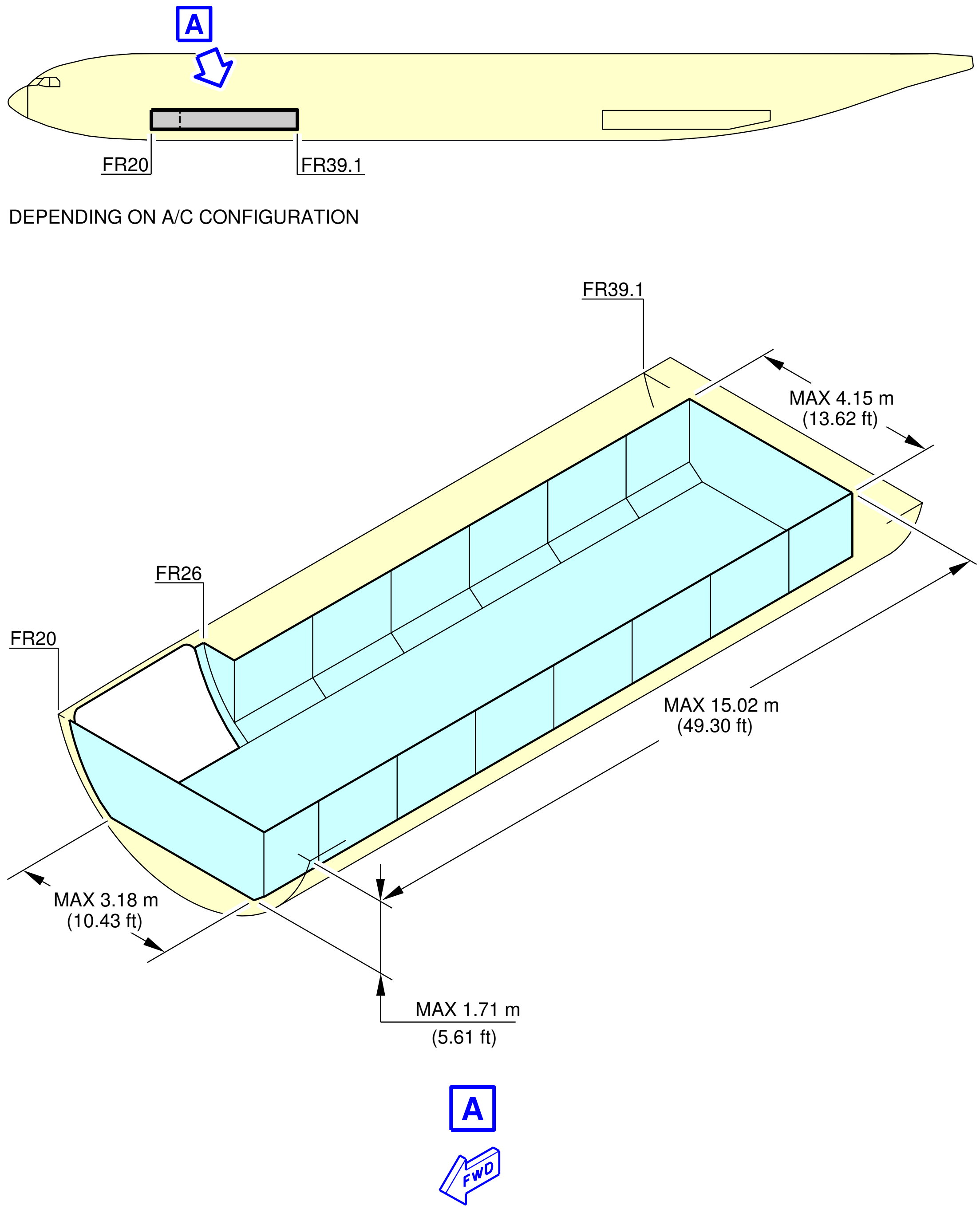
   NOTE : See your customized WBM for accurate data related to the aircraft configuration.

**ON A/C A330-200



Cargo Compartments
Location and Dimensions - Forward Cargo Compartment
FIGURE-09-10-14-991-001-A01

**ON A/C A330-300



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Cargo Compartments
Location and Dimensions - Forward Cargo Compartment
FIGURE-09-10-14-991-001-B01

**ON A/C A330-200 A330-300

DESC 09-10-14-003-A01

Aft Cargo Compartment

1. General
   This section gives data related to the location, dimensions and load capacity of the aft cargo compartment.

2. Location and Dimensions
   For the location and dimensions of the aft cargo compartment, see FIGURE 09-10-14-991-003-AFIGURE 09-10-14-991-003-B.

**ON A/C A330-200

3. Load Capacity
   The compartment has a maximum load capacity of approximately 15 241 kg (33 600 lb).
   The usable cargo volume for the different ULD are:
   - Usable containerized volume of approximately - 53.69 m^3 (1 869 ft^3), based on an LD3 container of - 4.47 m^3 (158 ft^3).
   - Usable palletized volume of approximately - 46.1 m^3 (1 628 ft^3), based on a 96 x 125 inch pallet of - 11.52 m^3 (407 ft^3), loaded to a height of 1.62 m (5.3 ft).

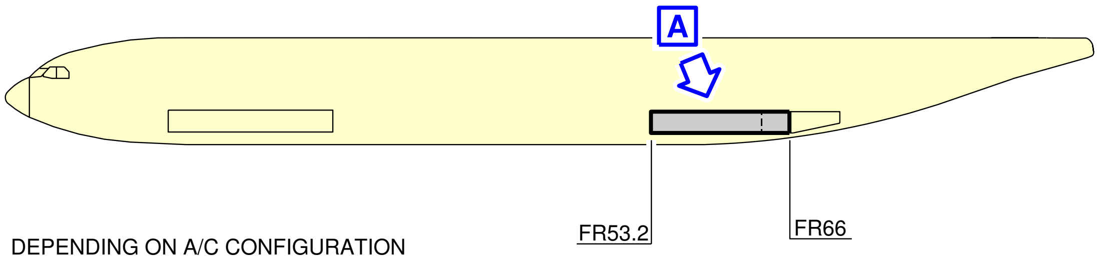
   NOTE : See your customized WBM for accurate data related to the aircraft configuration.

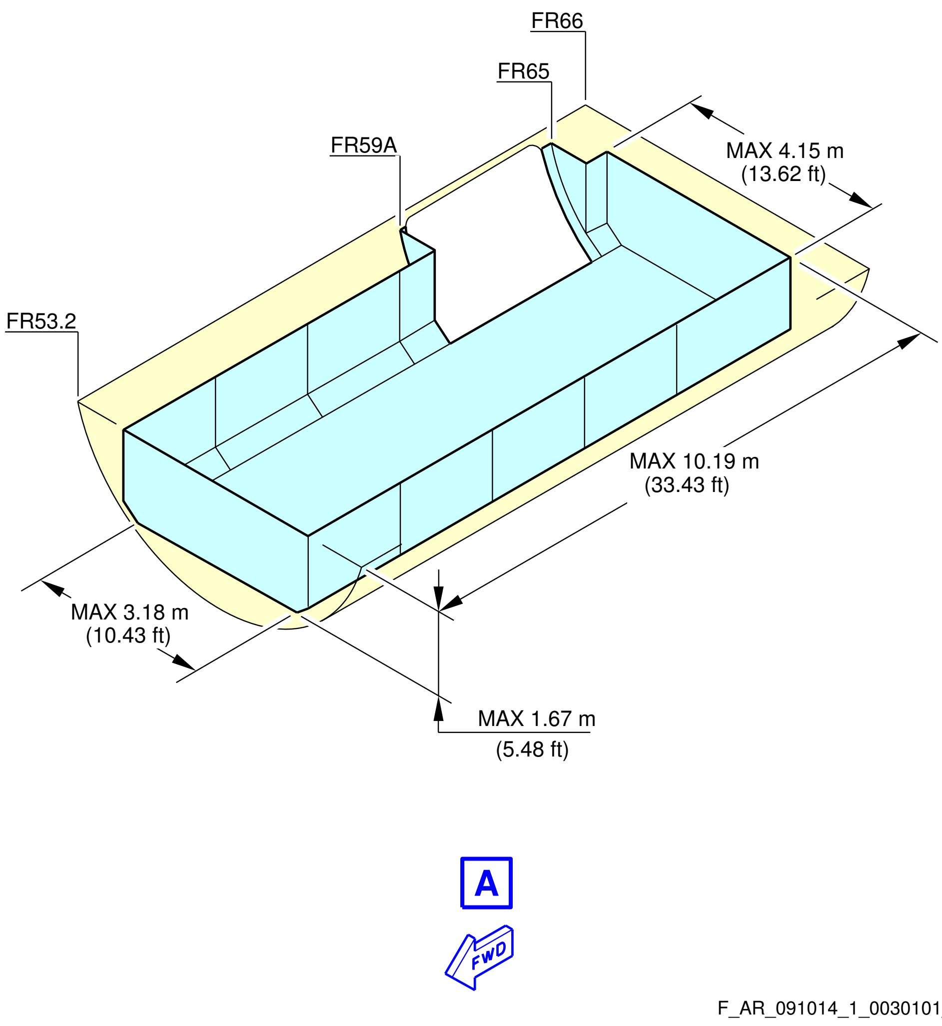
**ON A/C A330-300

4. Load Capacity
   The compartment has a maximum load capacity of approximately 18 507 kg (40 800 lb).
   The usable cargo volume for the different ULD are:
   - Usable containerized volume of approximately - 62.64 m^3 (2 212 ft^3), based on an LD3 container of - 4.47 m^3 (158 ft^3).
   - Usable palletized volume of approximately - 46.1 m^3 (1 628 ft^3), based on a 96 x 125 inch pallet of - 11.52 m^3 (407 ft^3), loaded to a height of 1.62 m (5.3 ft).

   NOTE : See your customized WBM for accurate data related to the aircraft configuration.

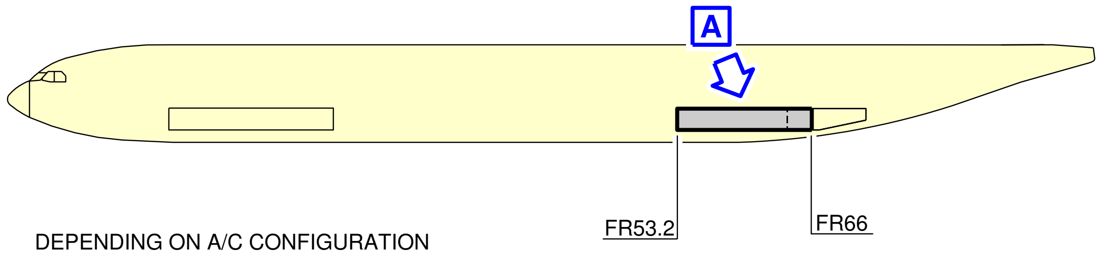
**ON A/C A330-200

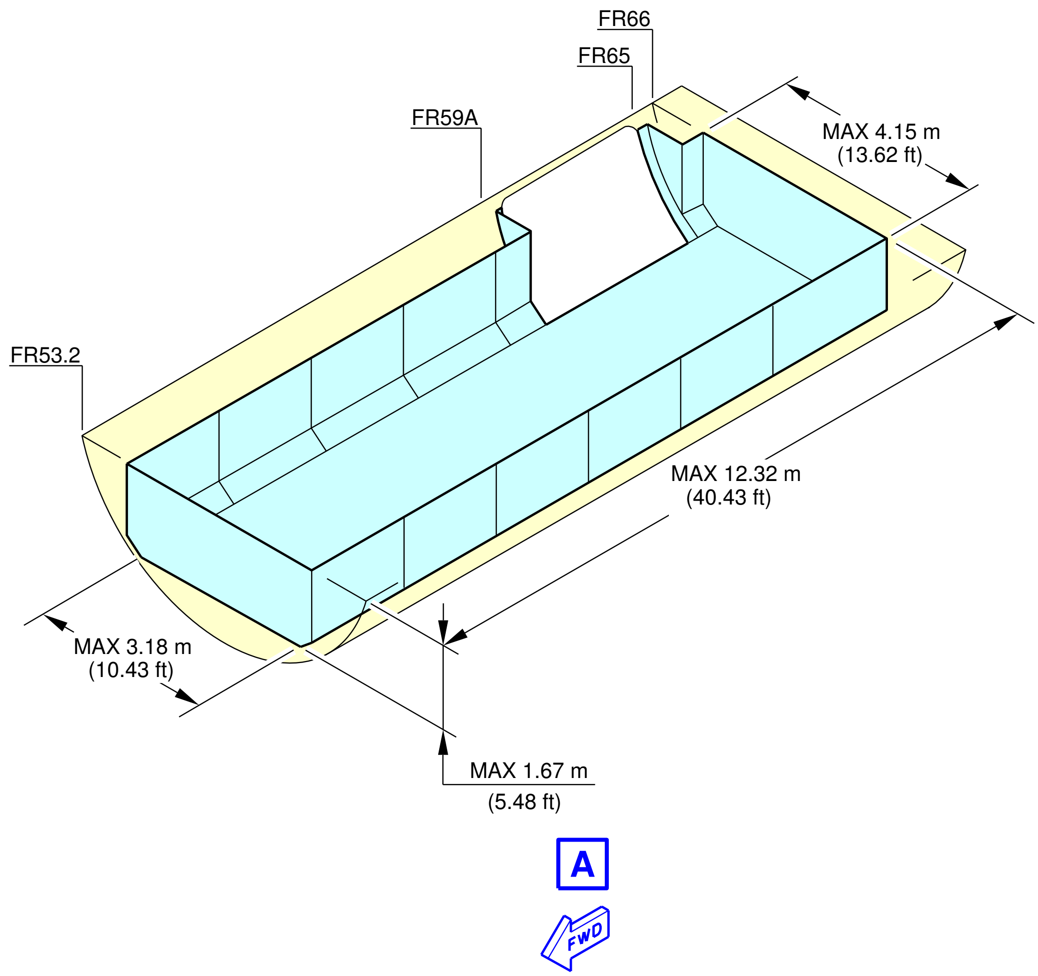




Cargo Compartments
Location and Dimensions - Aft Cargo Compartment
FIGURE-09-10-14-991-003-A01

**ON A/C A330-300





Cargo Compartments
Location and Dimensions - Aft Cargo Compartment
FIGURE-09-10-14-991-003-B01

**ON A/C A330-200 A330-300

DESC 09-10-14-004-A01

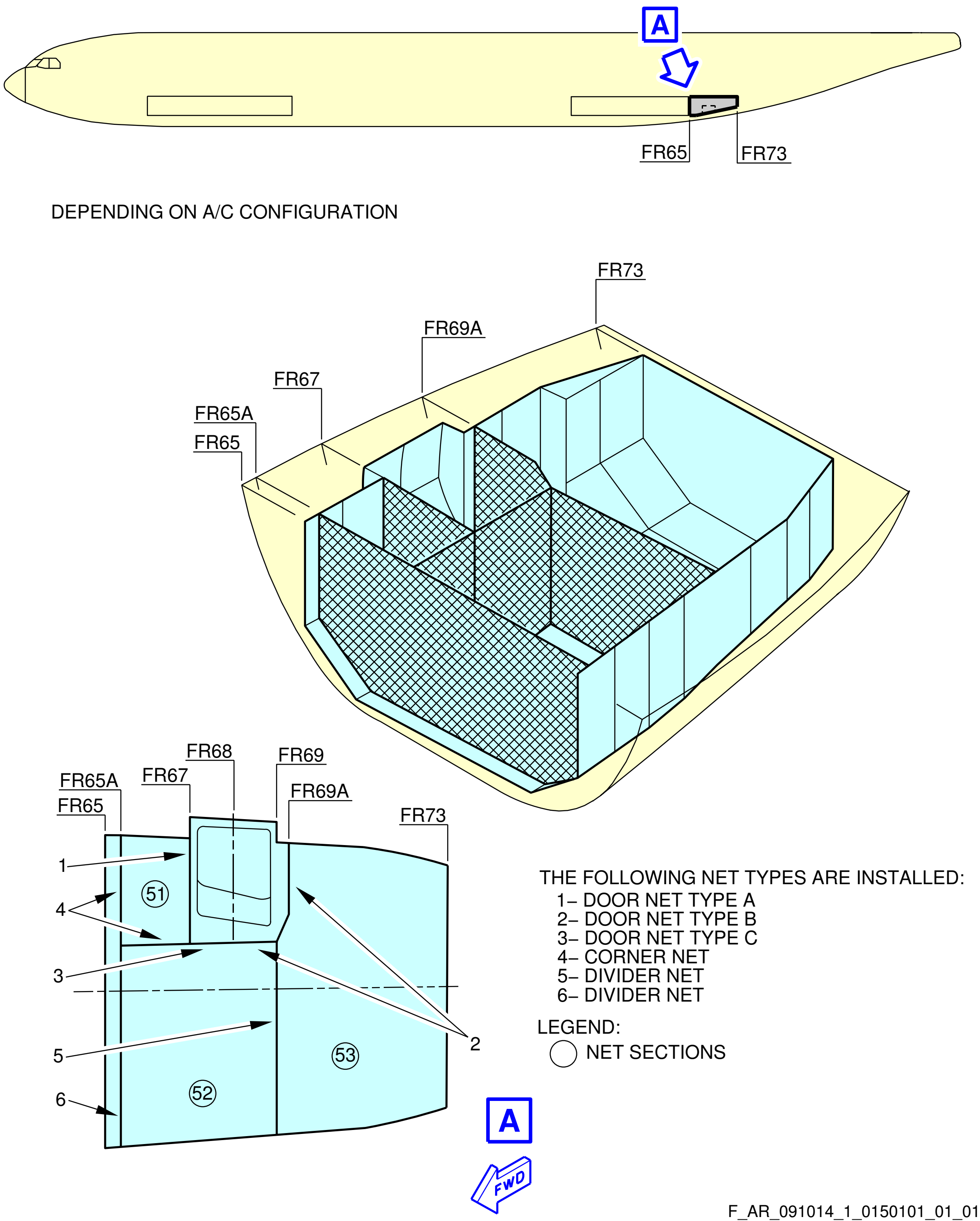
Bulk Cargo Compartment

1. General
This section gives data related to the location, dimensions and load capacity of the bulk cargo compartment. The compartment has removable divider, door area and partition nets, see FIGURE 09-10-14-991-015-AFIGURE 09-10-14-991-015-B. The floor of the compartment has some tie down points that have a maximum load capacity of 8 900 N (2 000 lbf).

2. Location and Dimensions
For the location and dimensions of the bulk cargo compartment, see FIGURE 09-10-14-991-016-AFIGURE 09-10-14-991-016-B.

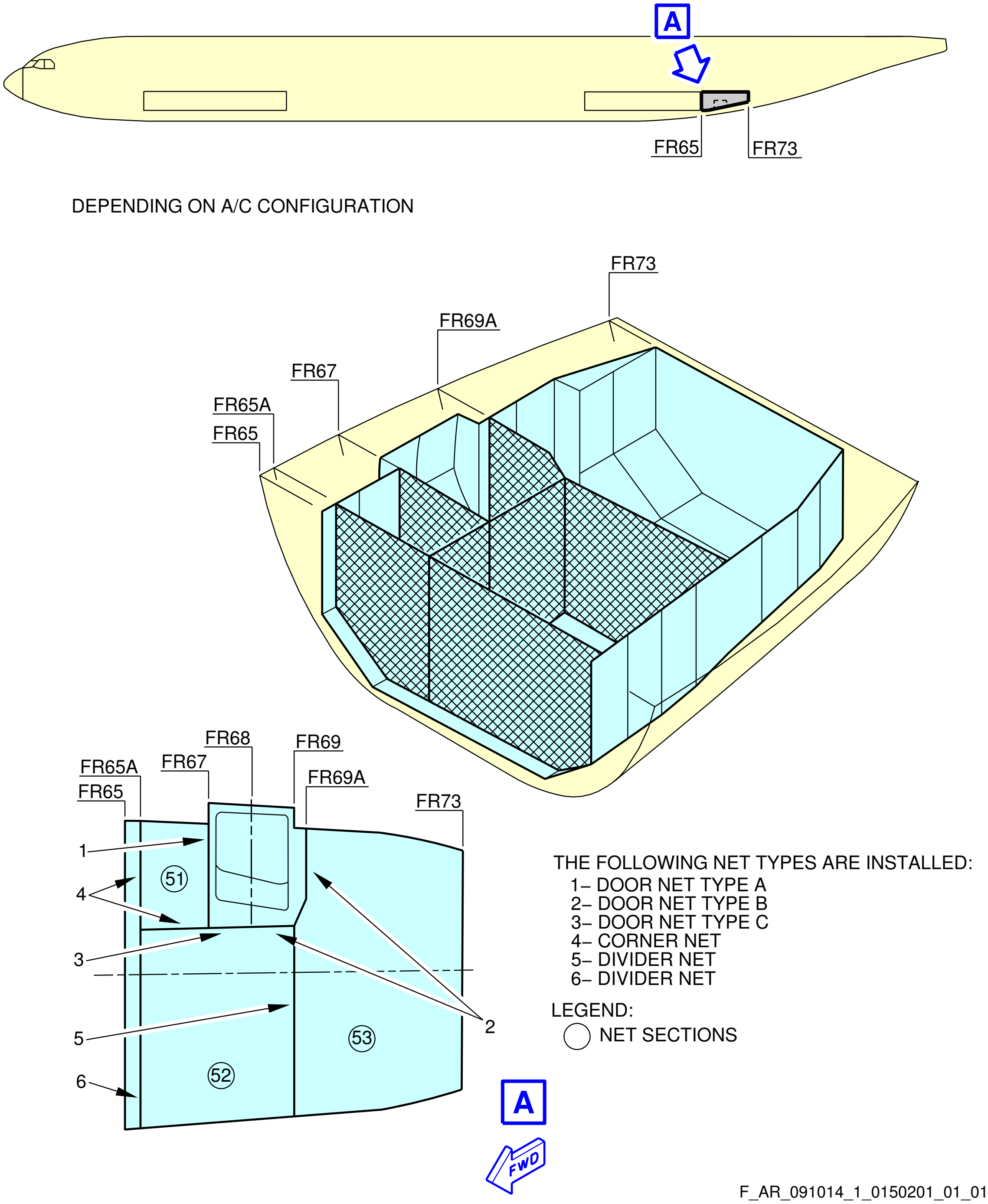
3. Load Capacity
The compartment has a maximum load capacity of approximately:
   - 3 468 kg (7 645 lb) and a maximum cargo volume of 19.7 m^3 (695 ft^3).

**ON A/C A330-200



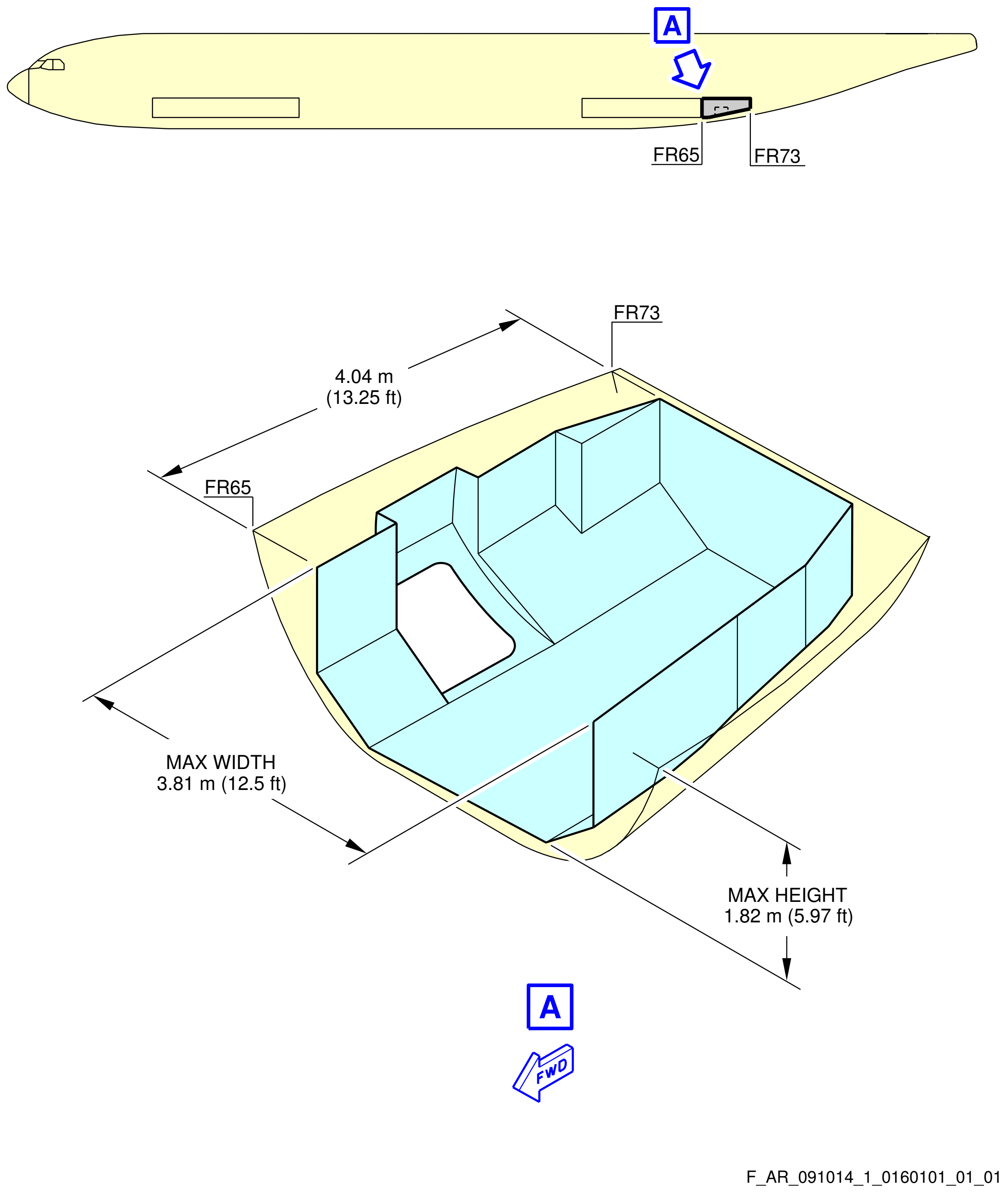
Cargo Compartments
Cargo Nets - Bulk Cargo Compartment
FIGURE-09-10-14-991-015-A01

**ON A/C A330-300



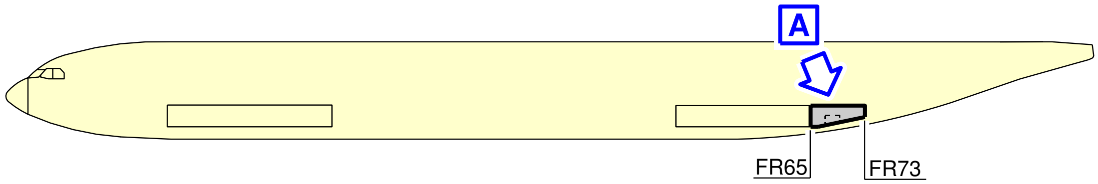
Cargo Compartments
Cargo Nets - Bulk Cargo Compartment
FIGURE-09-10-14-991-015-B01

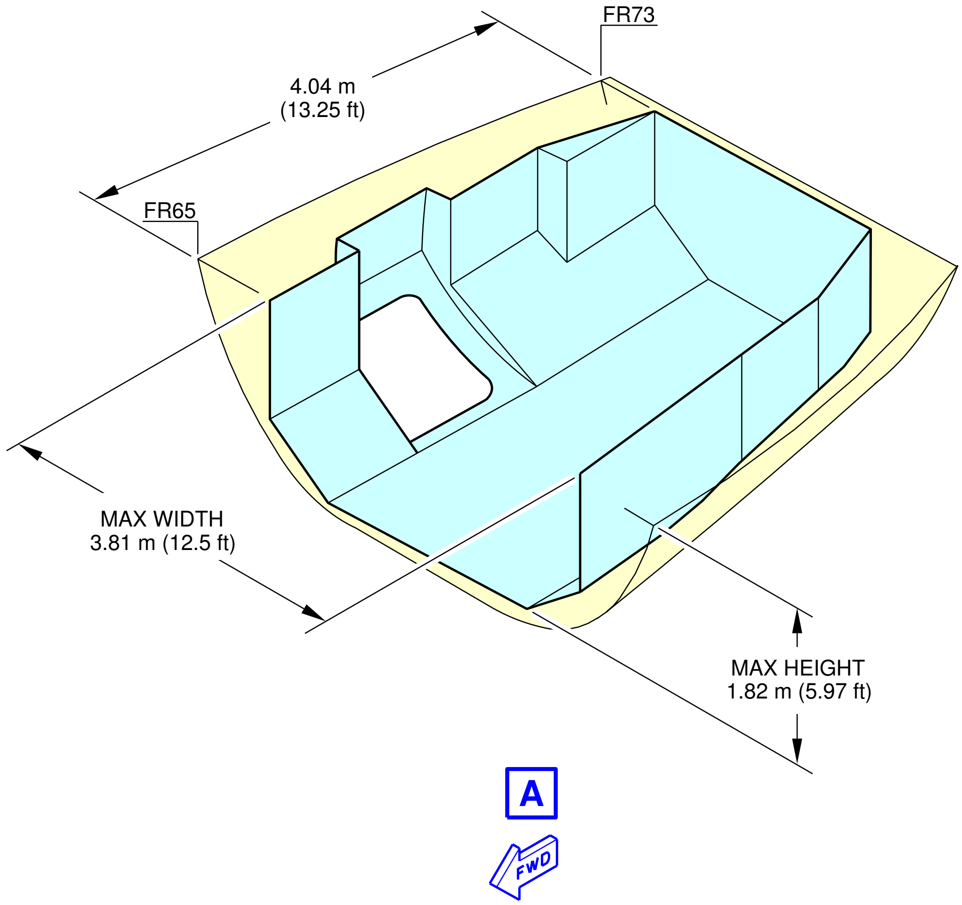
**ON A/C A330-200



Cargo Compartments
Location and Dimensions - Bulk Cargo Compartment
FIGURE-09-10-14-991-016-A01

**ON A/C A330-300





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Cargo Compartments
Location and Dimensions - Bulk Cargo Compartment
FIGURE-09-10-14-991-016-B01

09-10-15 LOCATION OF HAZARDOUS MATERIALS

**ON A/C A330-200 A330-300

DESC 09-10-15-001-A01

General

1. A number of items and areas on the aircraft contain Hazardous Materials.

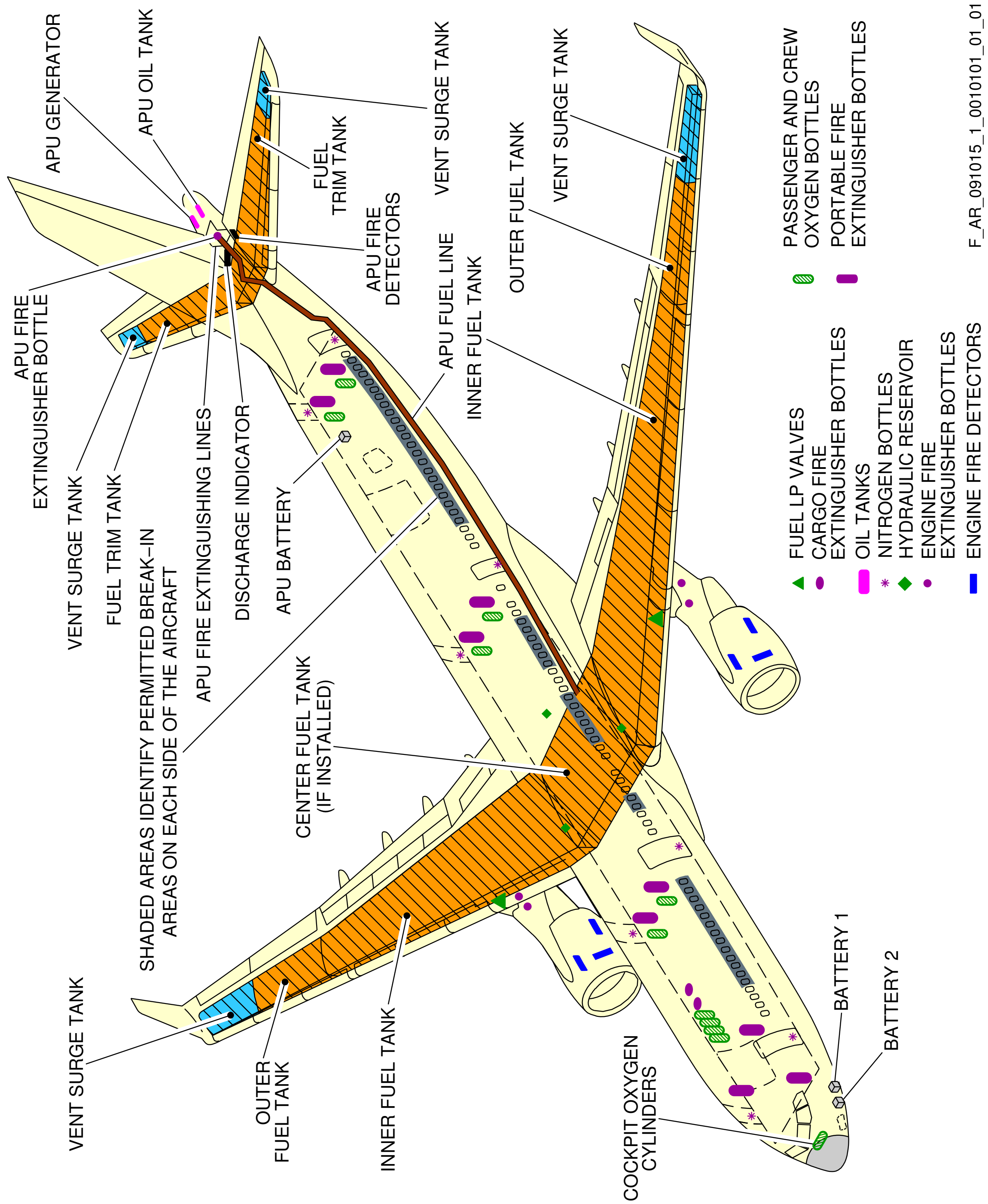
WARNING : IDENTIFY WHICH HAZARDOUS MATERIALS WERE TRANSPORTED IN THE CARGO COMPARTMENTS.

NOTE : The List of Radioactive and hazardous Element manual (LRE) gives information on these materials.

TheFIGURE 09-10-15-991-001-A gives the general location of the Hazardous Materials that you can find on the aircraft.

NOTE : The number and arrangement of the portable equipment depend on the aircraft configuration.

**ON A/C A330-200 A330-300



Hazardous Materials
Location
FIGURE-09-10-15-991-001-A01

09-10-16 LANDING GEARS

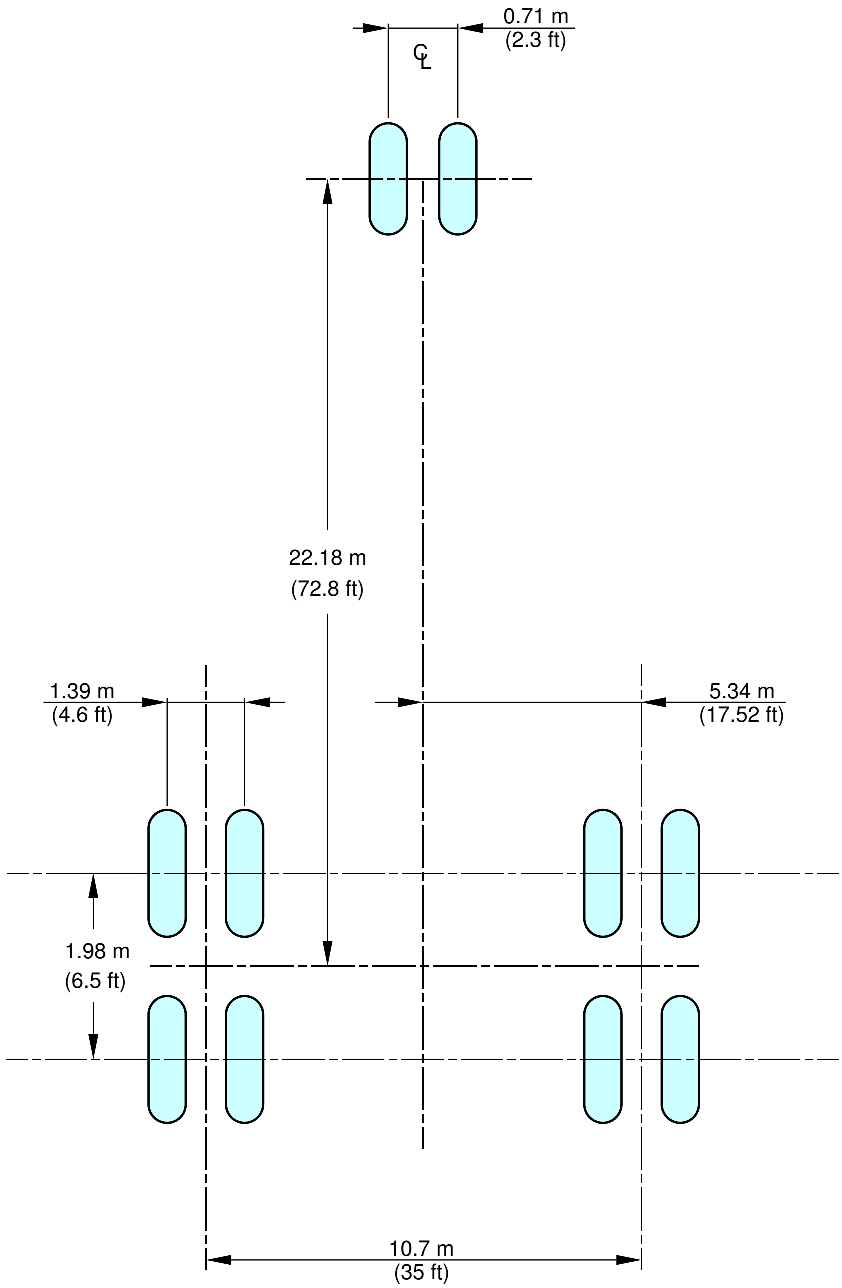
****ON A/C A330-200 A330-300**

DESC 09-10-16-001-A01

General

1. This chapter gives details on the landing gears.
   - For Landing Gear Footprints, see FIGURE 09-10-16-991-001-AFIGURE 09-10-16-991-001-B.
   - For Nose Landing Gear Description, see FIGURE 09-10-16-991-002-A.
   - For Main Landing Gear Description, see FIGURE 09-10-16-991-003-A.
   - For Nose Landing Gear Doors description, see FIGURE 09-10-16-991-004-A.
   - For Main Landing Gear Doors description, see FIGURE 09-10-16-991-005-A.

**ON A/C A330-200



NOTE: DIMENSIONS IN METERS (FEET IN BRACKETS).

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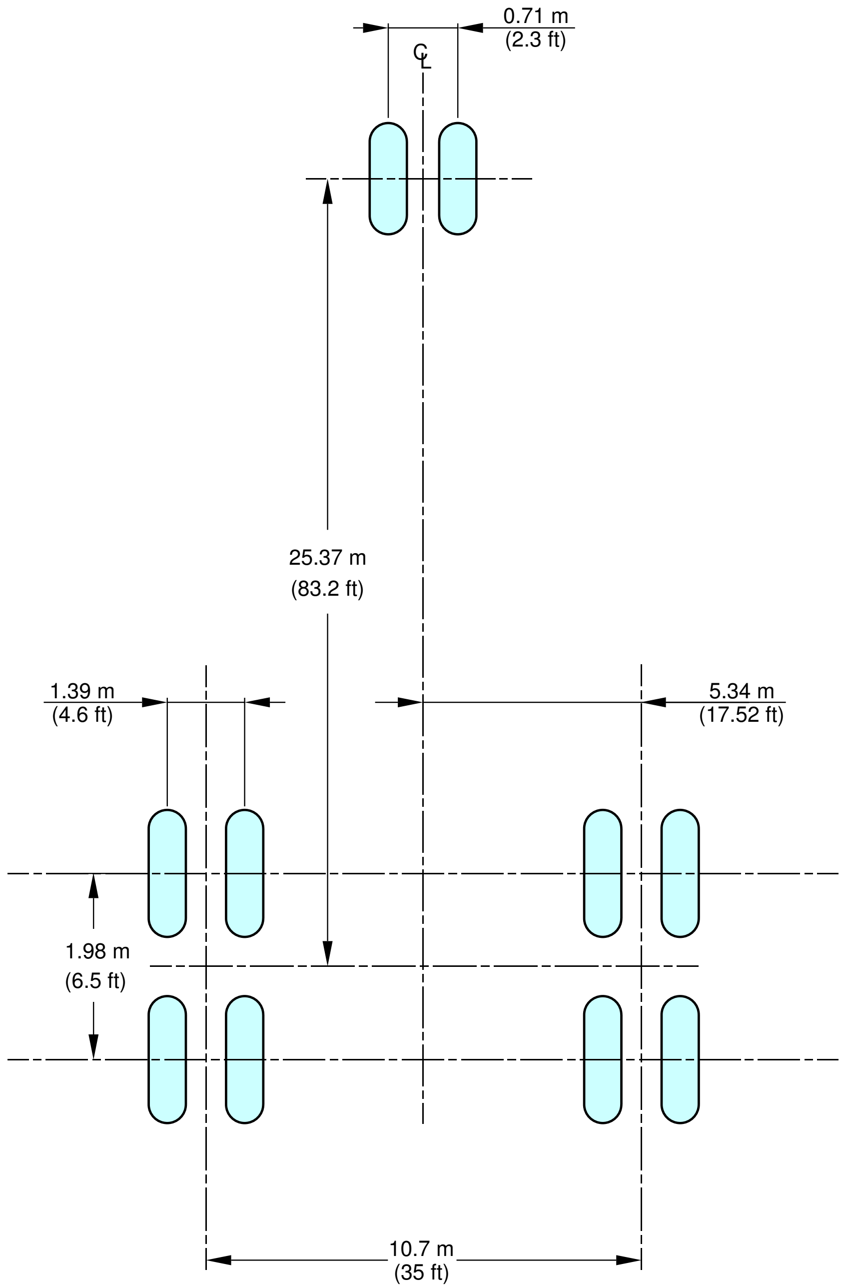
Footprints
Landing Gear
FIGURE-09-10-16-991-001-A01

**ON A/C A330-300

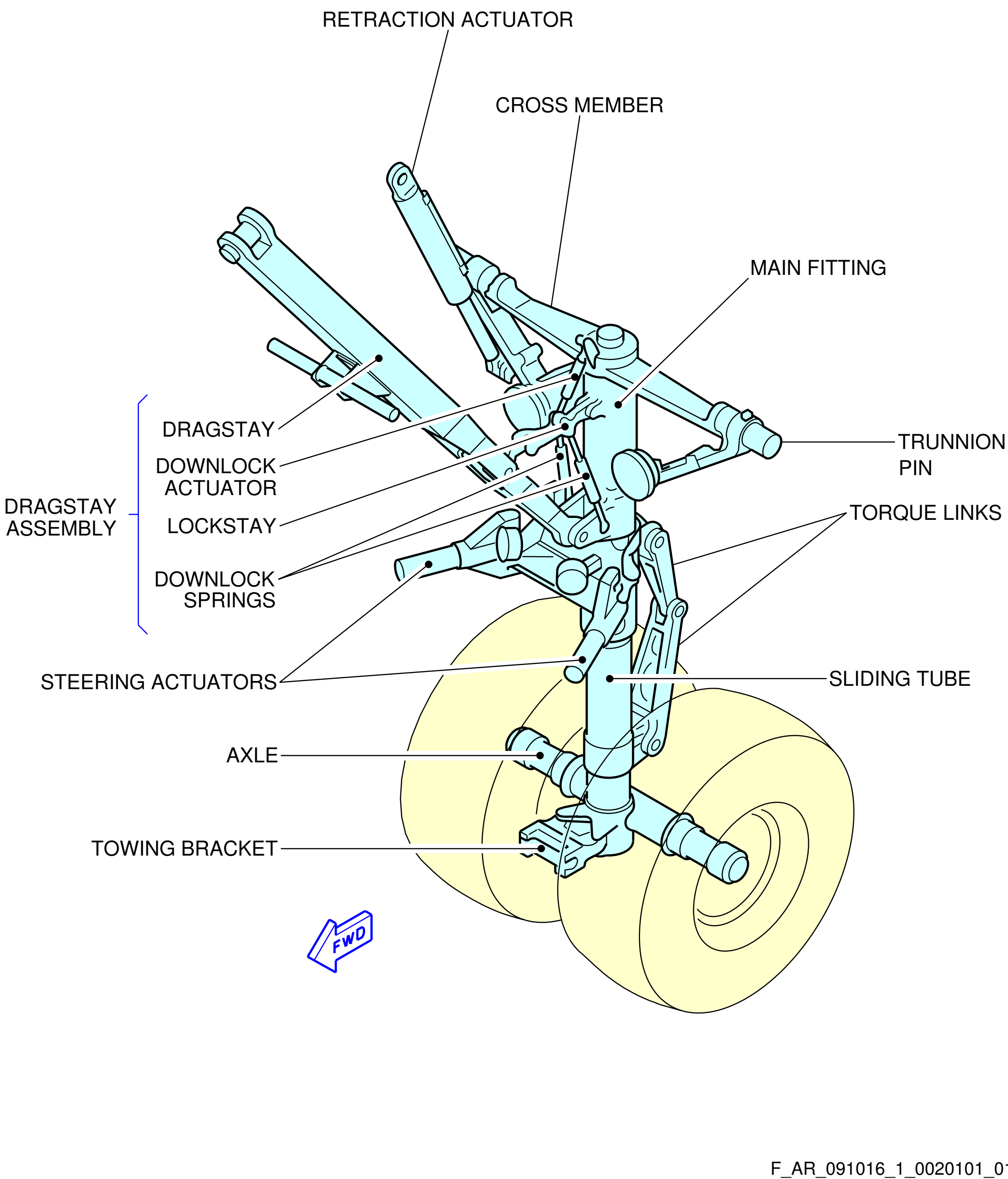


NOTE: DIMENSIONS IN METERS (FEET IN BRACKETS).

F_AR_091016_1_0010201_01_00

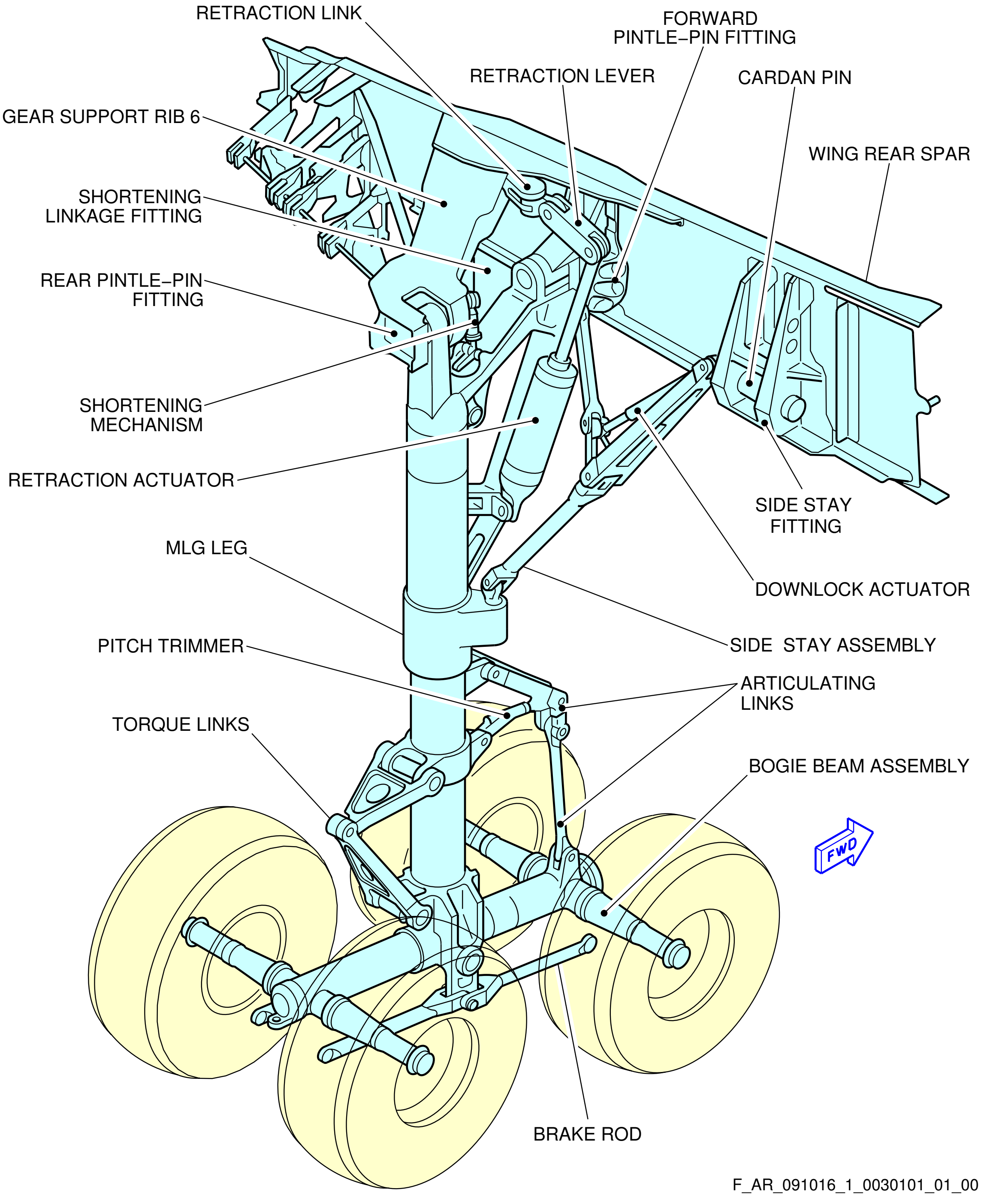
Footprints
Landing Gear
FIGURE-09-10-16-991-001-B01

**ON A/C A330-200 A330-300



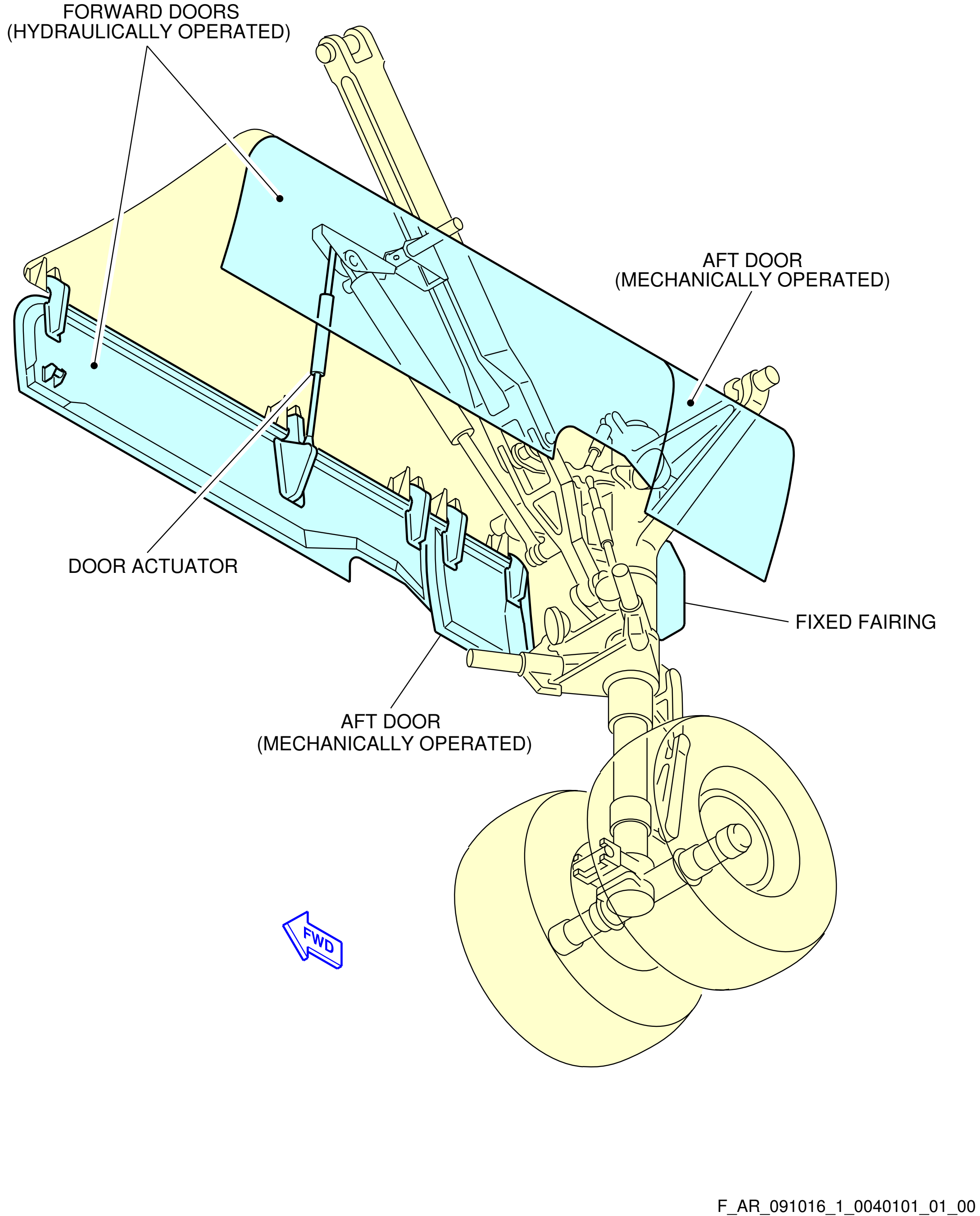
Description
Nose Landing Gear
FIGURE-09-10-16-991-002-A01

**ON A/C A330-200 A330-300



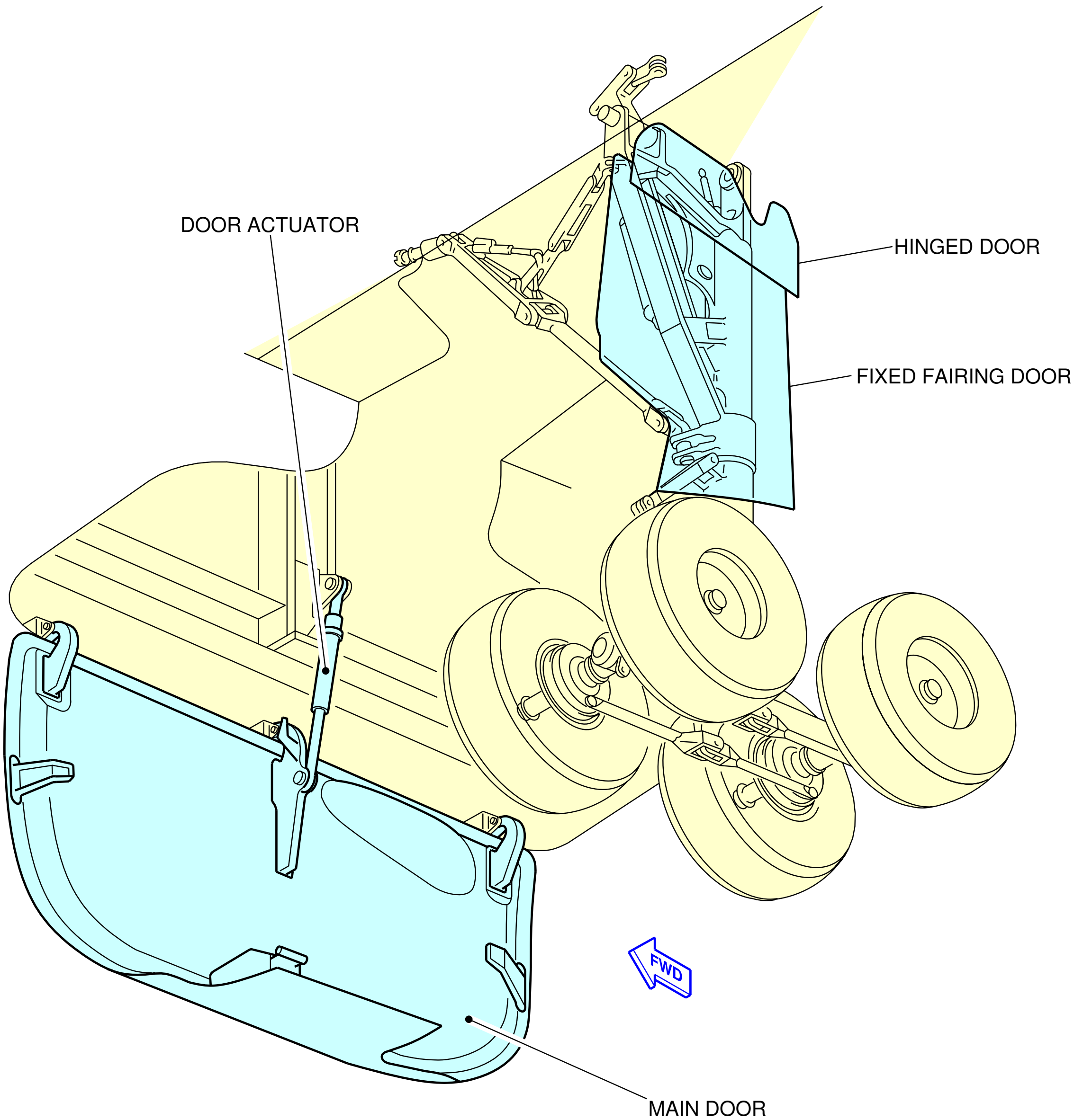
Description
Main Landing Gear
FIGURE-09-10-16-991-003-A01

**ON A/C A330-200 A330-300



Doors
Nose Landing Gear
FIGURE-09-10-16-991-004-A01

**ON A/C A330-200 A330-300



Doors
Main Landing Gear
FIGURE-09-10-16-991-005-A01

09-20 RECOVERY PREPARATION

09-20-01 QUICK REFERENCE DATA

****ON A/C A330-200 A330-300**

DESC 09-20-01-001-A01

General

1. This chapter is broken down as follows:
   A. Aircraft Recovery Logic Charts DESC 09-20-01-002-A01.
   B. Aircraft Recovery Process Document DESC 09-20-01-004-A01.
   C. IATA Aircraft Recovery Quick Reference Check List TASK 09-20-01-869-801-A01.

****ON A/C A330-200 A330-300**

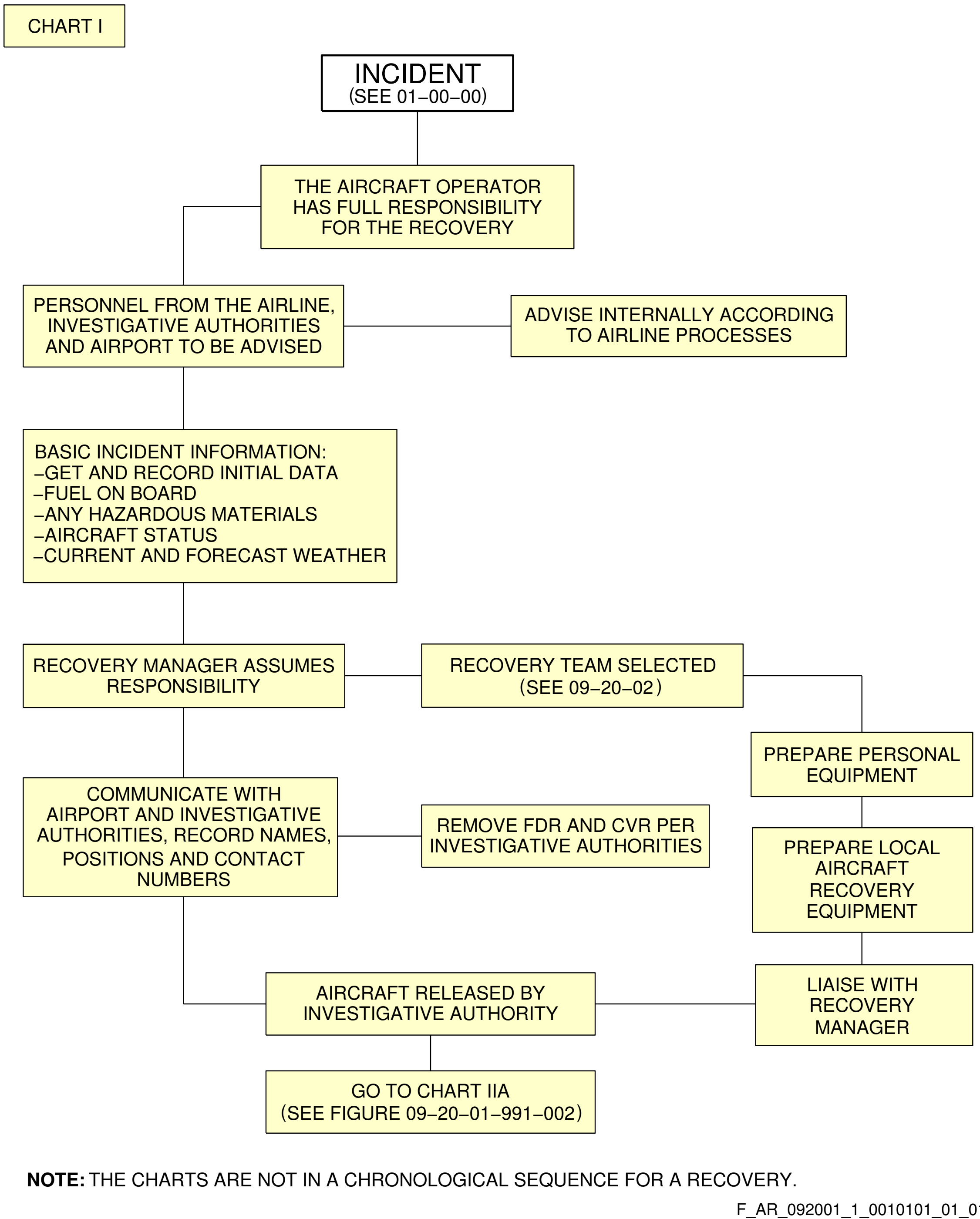
DESC 09-20-01-002-A01

Aircraft Recovery Logic Chart

NOTE : The charts are not in chronological sequence for recovery. Make a selection of the charts applicable to each recovery scenario.

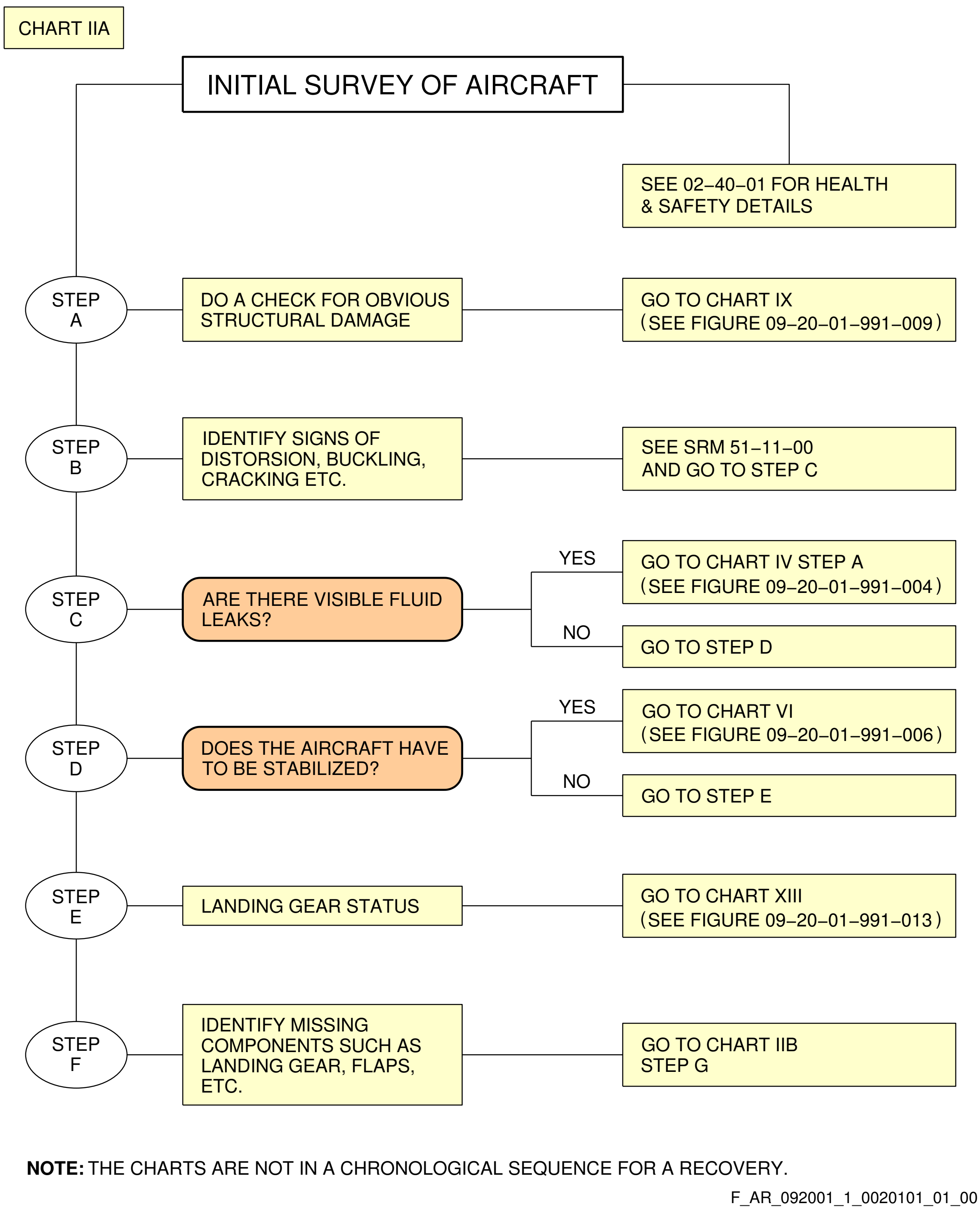
1. See DESC 02-10-01-002-A01 for description of aircraft recovery charts and the way to use them. When you use these charts, the conditions that follow are assumed:
   - Warnings and cautions are not included on the recovery charts.
   - The aircraft operator has full responsibility for all the aircraft recovery operation.
   - The recovery operation can only start when the local and state Investigative Authorities release the aircraft.
   - All company, local and state health and safety regulations are obeyed.
   - All hazardous materials are identified and correctly handled.
   - The standard "Aircraft Status for Maintenance" is in general not available (see AMM 00 Introduction, Item 7).
   - The aircraft is possibly in an unusual attitude and can be unstable.
   - Some of the steps listed are possibly not in chronological sequence because each recovery operation is different and the recovery procedure must be adapted.
   - It is possible that some of the steps listed are completed more than one time.

**ON A/C A330-200 A330-300



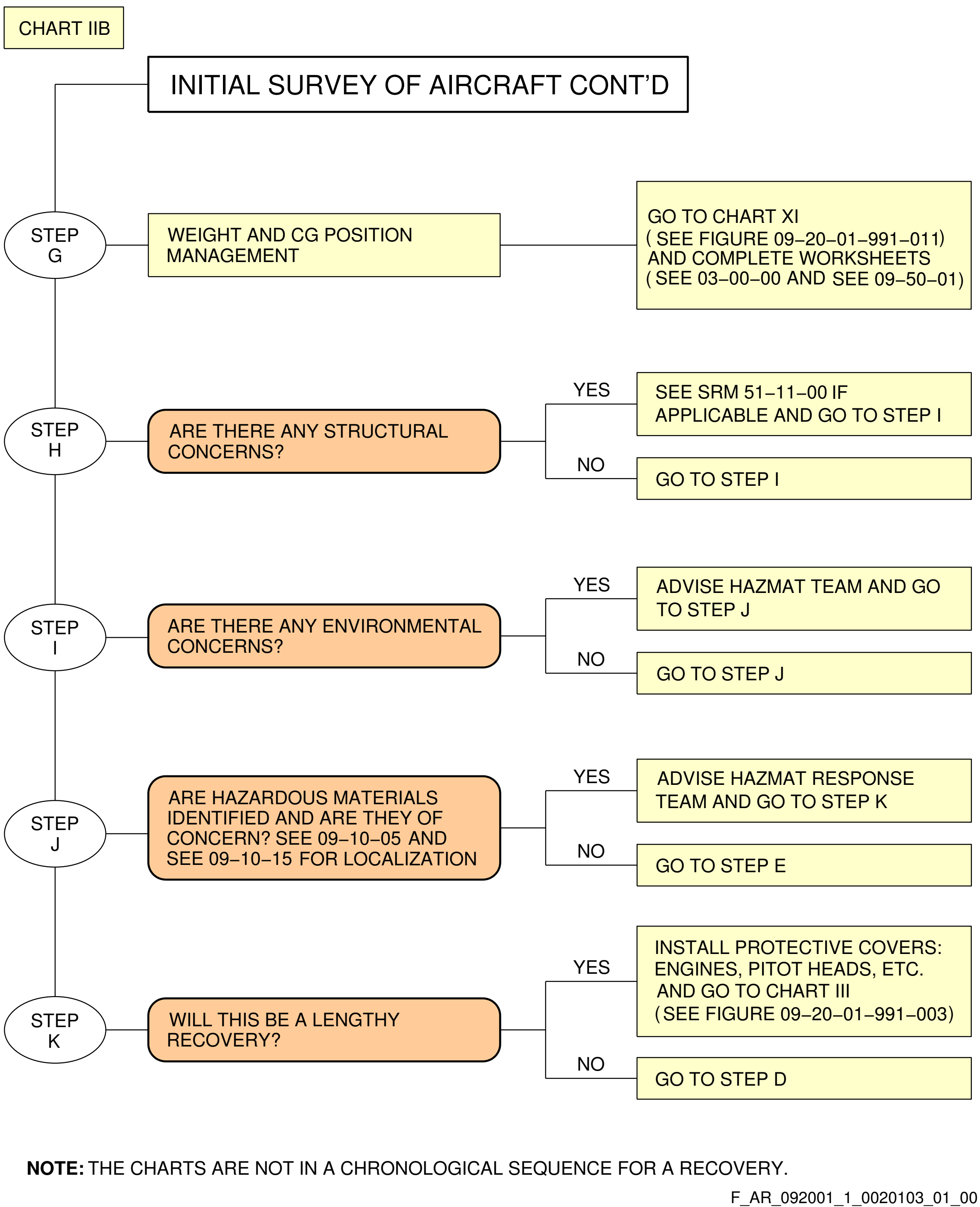
Aircraft Recovery Logic Chart
Chart I
FIGURE-09-20-01-991-001-A01

**ON A/C A330-200 A330-300



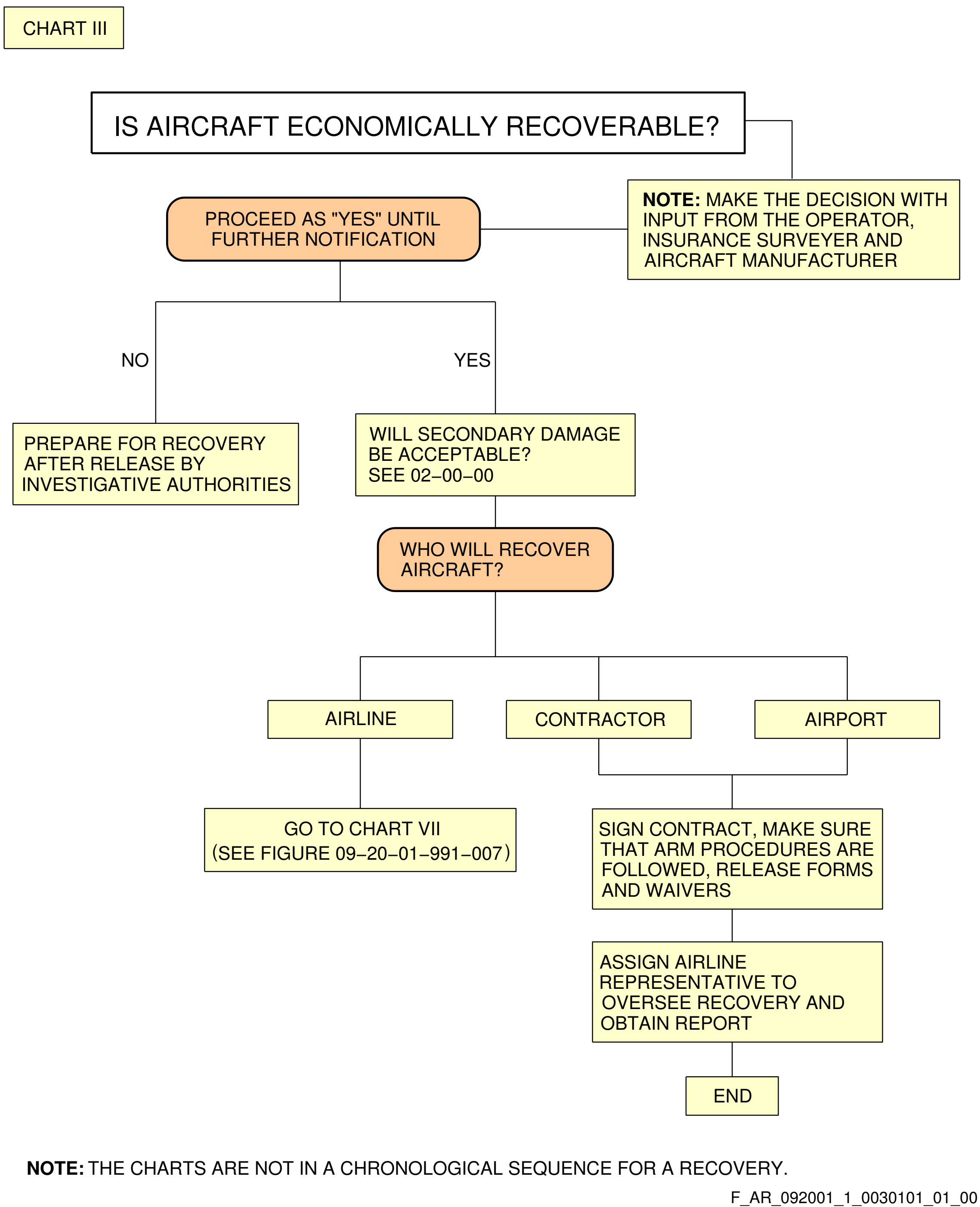
Aircraft Recovery Logic Chart
Chart IIA (Sheet 1 of 2)
FIGURE-09-20-01-991-002-A01

**ON A/C A330-200 A330-300



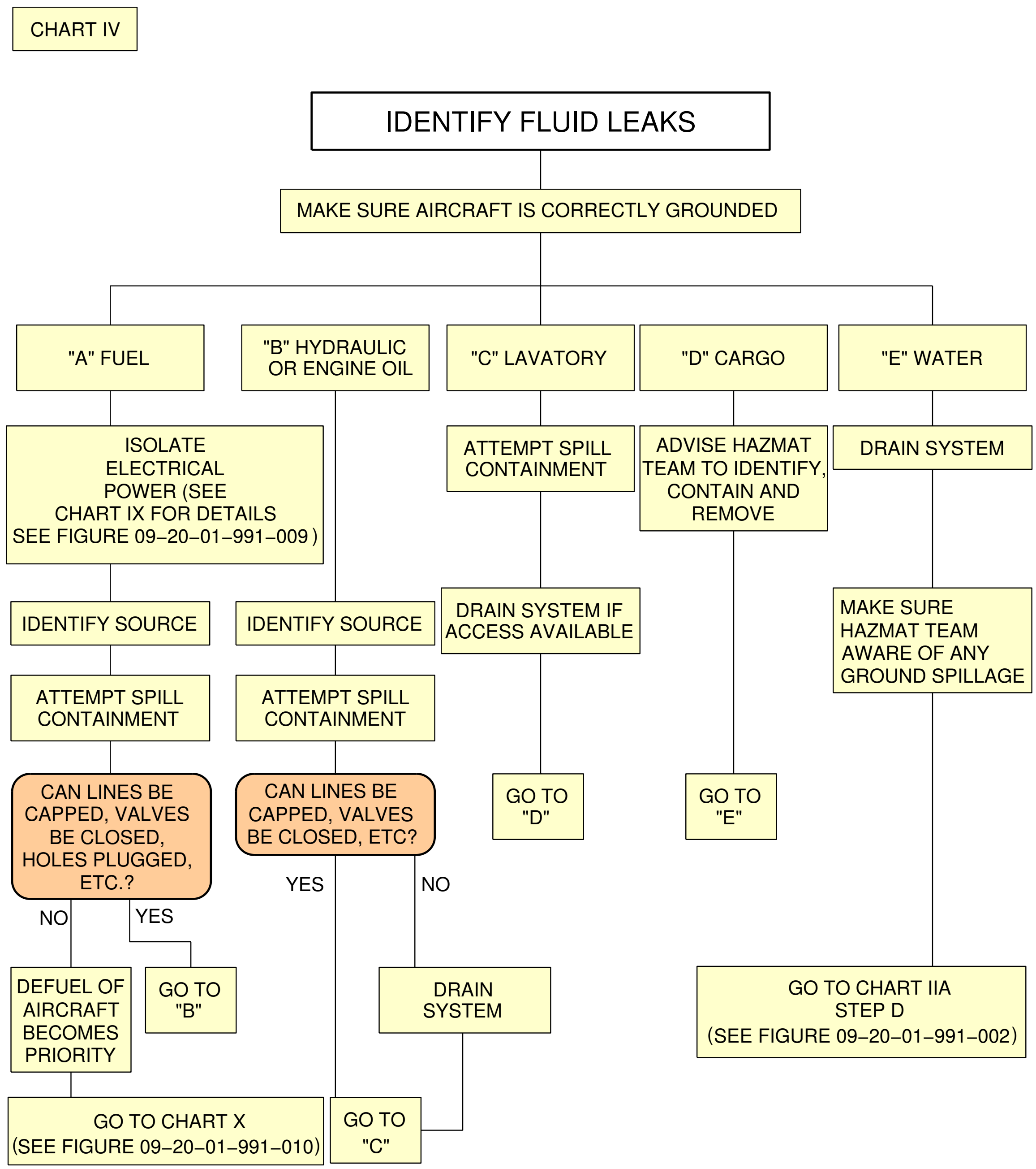
Aircraft Recovery Logic Chart
Chart IIB (Sheet 2 of 2)
FIGURE-09-20-01-991-002-A01

**ON A/C A330-200 A330-300



Aircraft Recovery Logic Chart
Chart III
FIGURE-09-20-01-991-003-A01

**ON A/C A330-200 A330-300



NOTE: THE CHARTS ARE NOT IN A CHRONOLOGICAL SEQUENCE FOR A RECOVERY.

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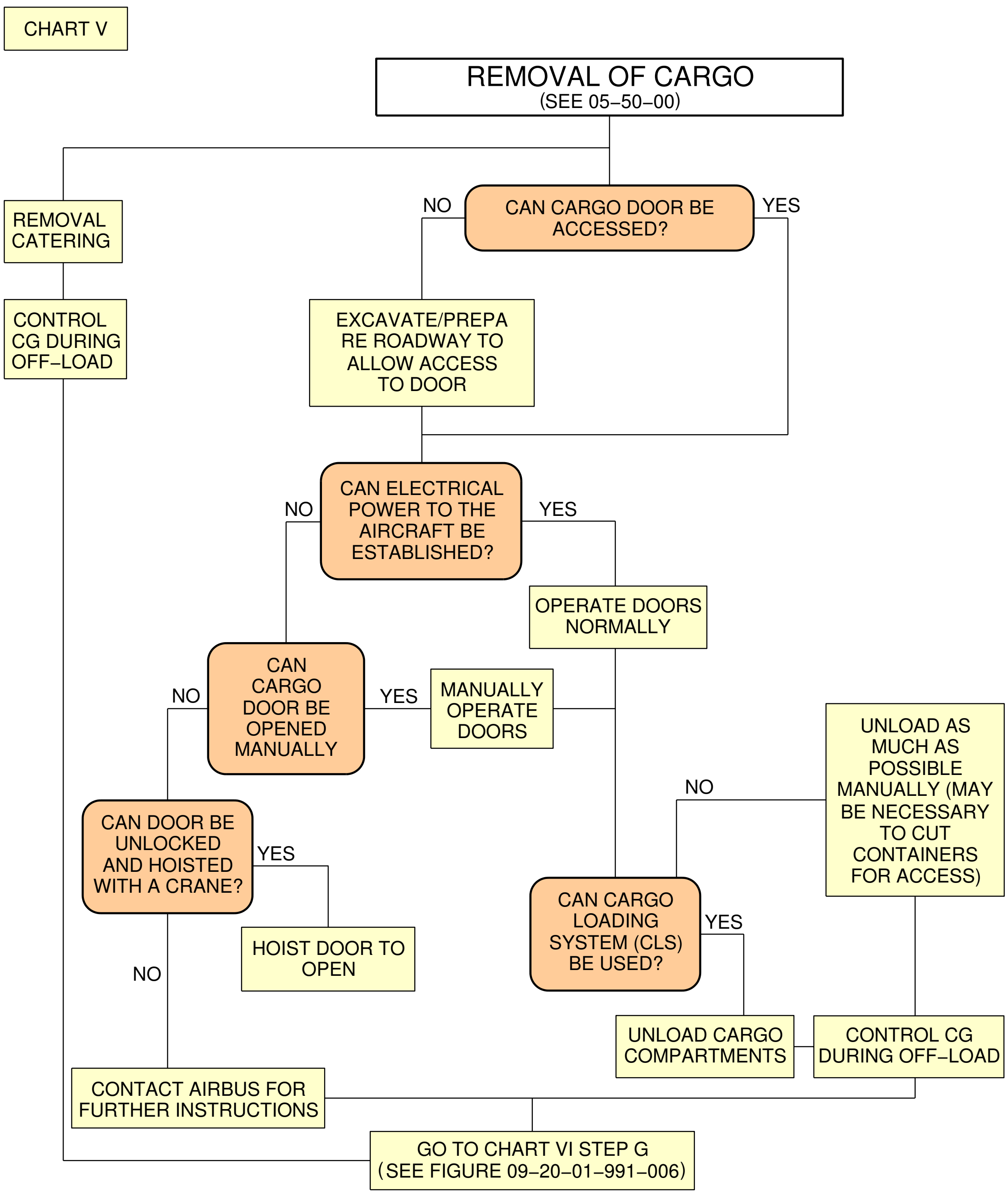
Aircraft Recovery Logic Chart
Chart IV
FIGURE-09-20-01-991-004-A01

**ON A/C A330-200 A330-300



NOTE: THE CHARTS ARE NOT IN A CHRONOLOGICAL SEQUENCE FOR A RECOVERY.

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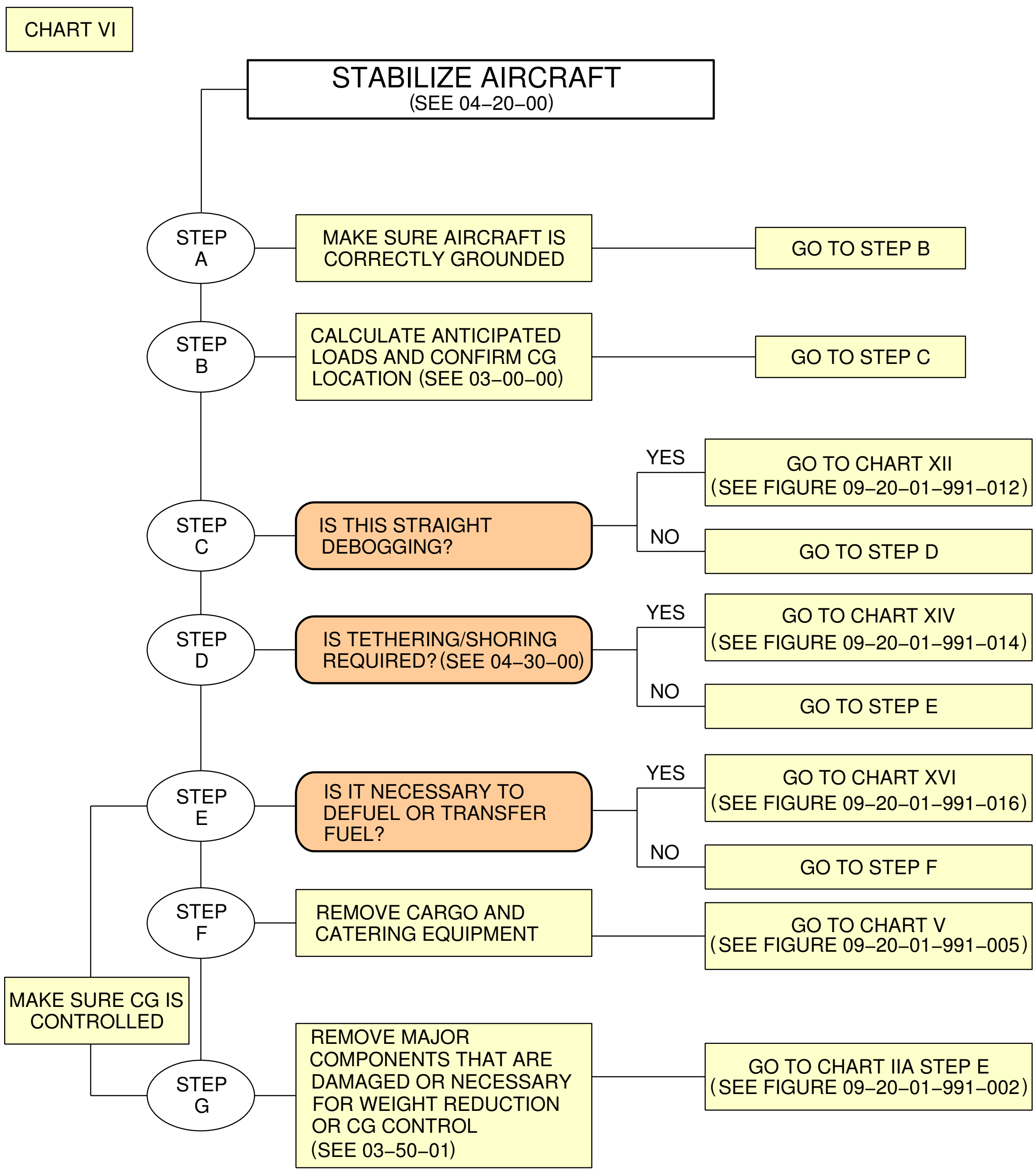
Aircraft Recovery Logic Chart
Chart V
FIGURE-09-20-01-991-005-A01

**ON A/C A330-200 A330-300



NOTE: THE CHARTS ARE NOT IN A CHRONOLOGICAL SEQUENCE FOR A RECOVERY.

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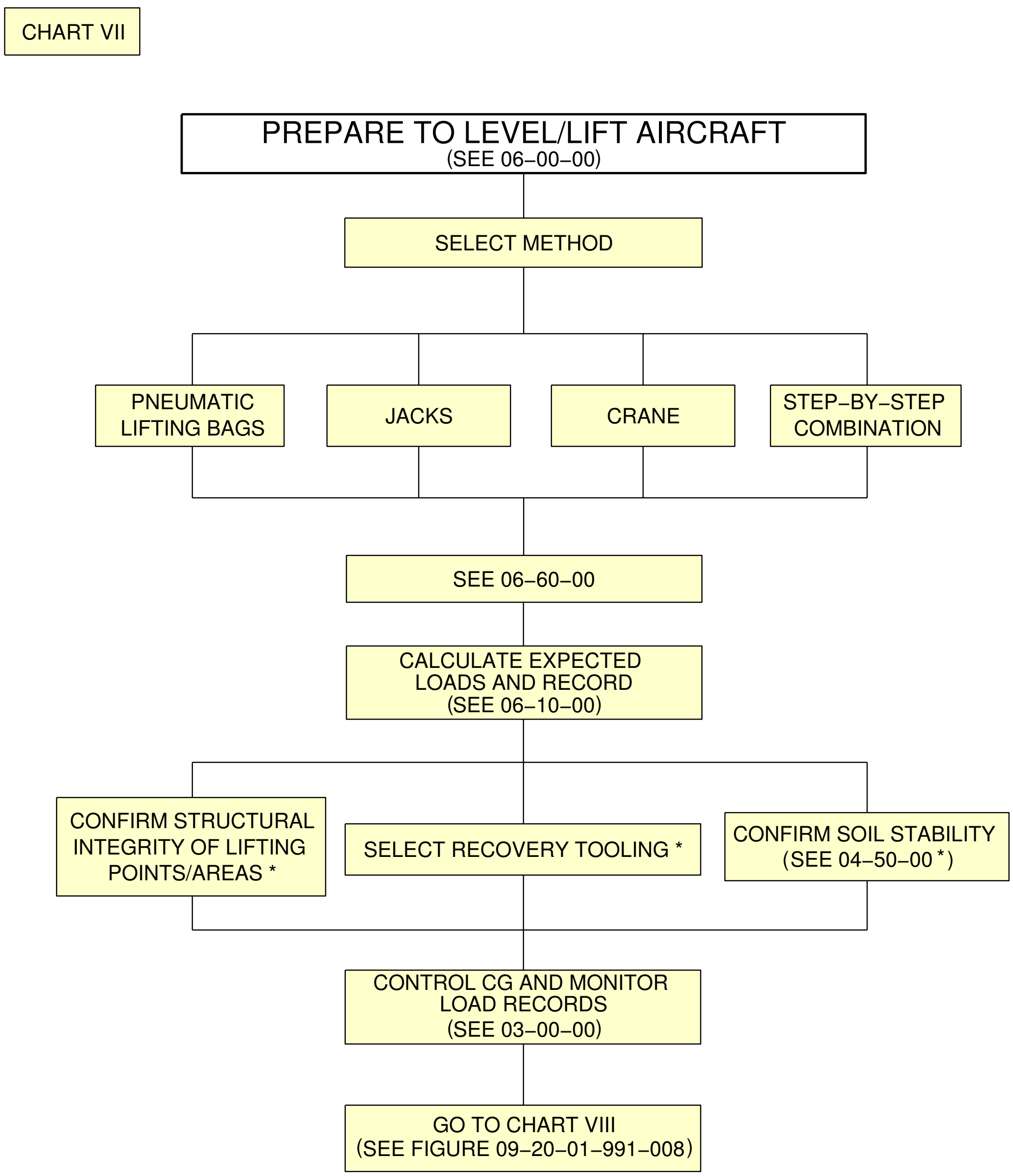
Aircraft Recovery Logic Chart
Chart VI
FIGURE-09-20-01-991-006-A01

**ON A/C A330-200 A330-300



*: BEFORE CONSIDERING WHICH LEVELING /LIFTING OPTION TO USE YOU MUST MAKE AN ACCURATE WEIGHT AND CG ANALYSIS – THIS WILL GIVE YOU THE OPTIMUM POSTIONS AND LOADS FOR THE LIFTING EQUIPMENT.

NOTE: THE CHARTS ARE NOT IN A CHRONOLOGICAL SEQUENCE FOR A RECOVERY.

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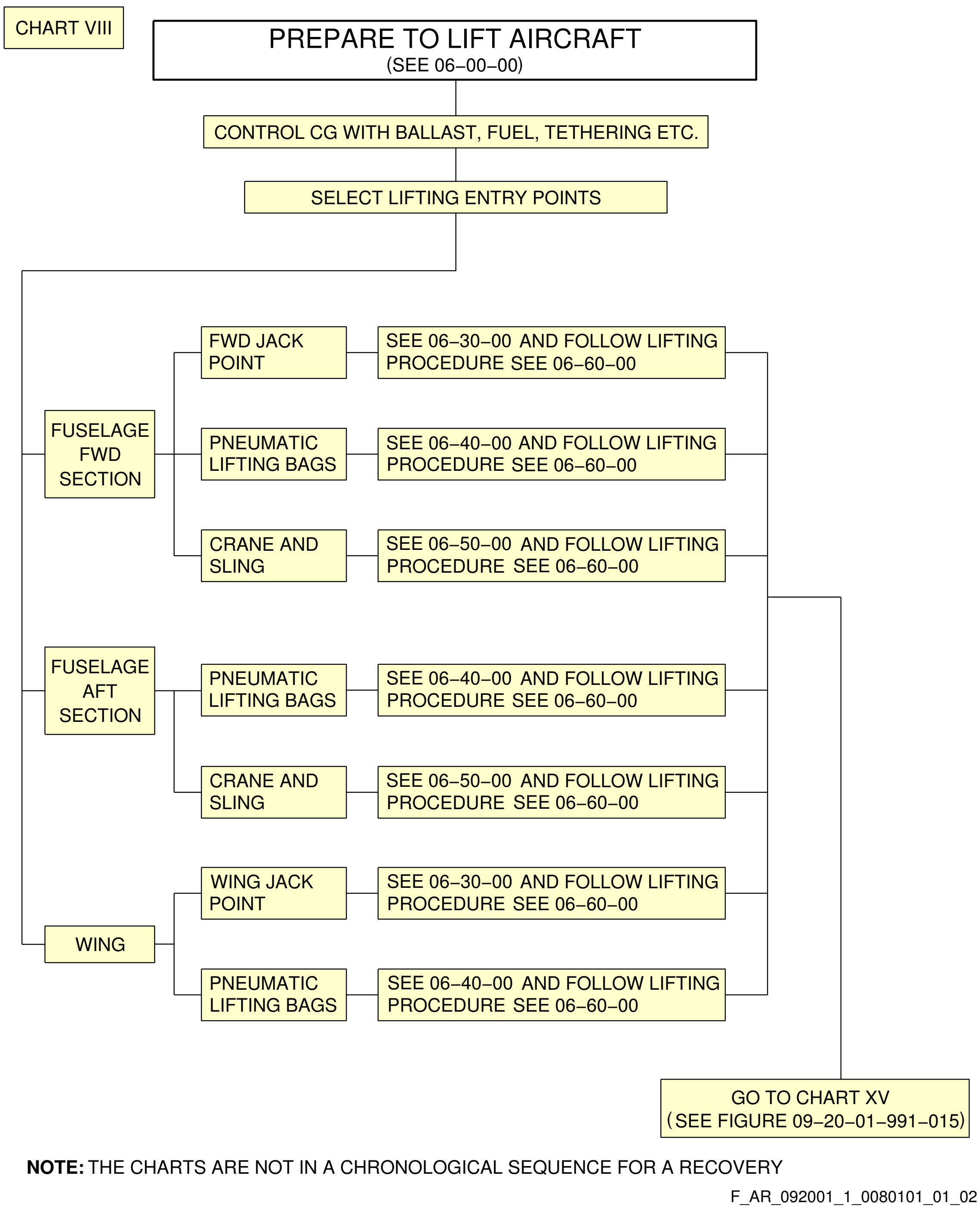
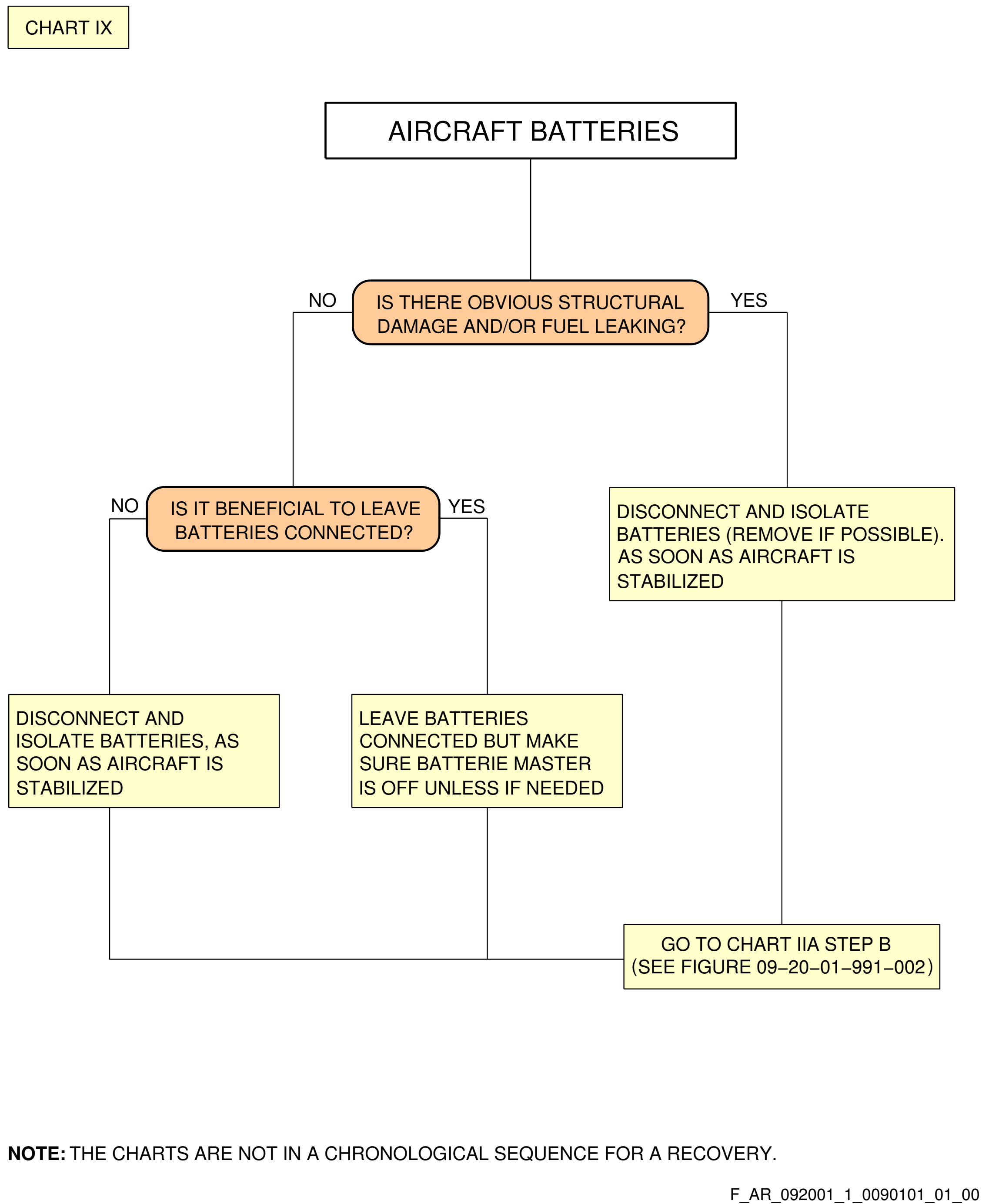
Aircraft Recovery Logic Chart
Chart VII
FIGURE-09-20-01-991-007-A01

**ON A/C A330-200 A330-300



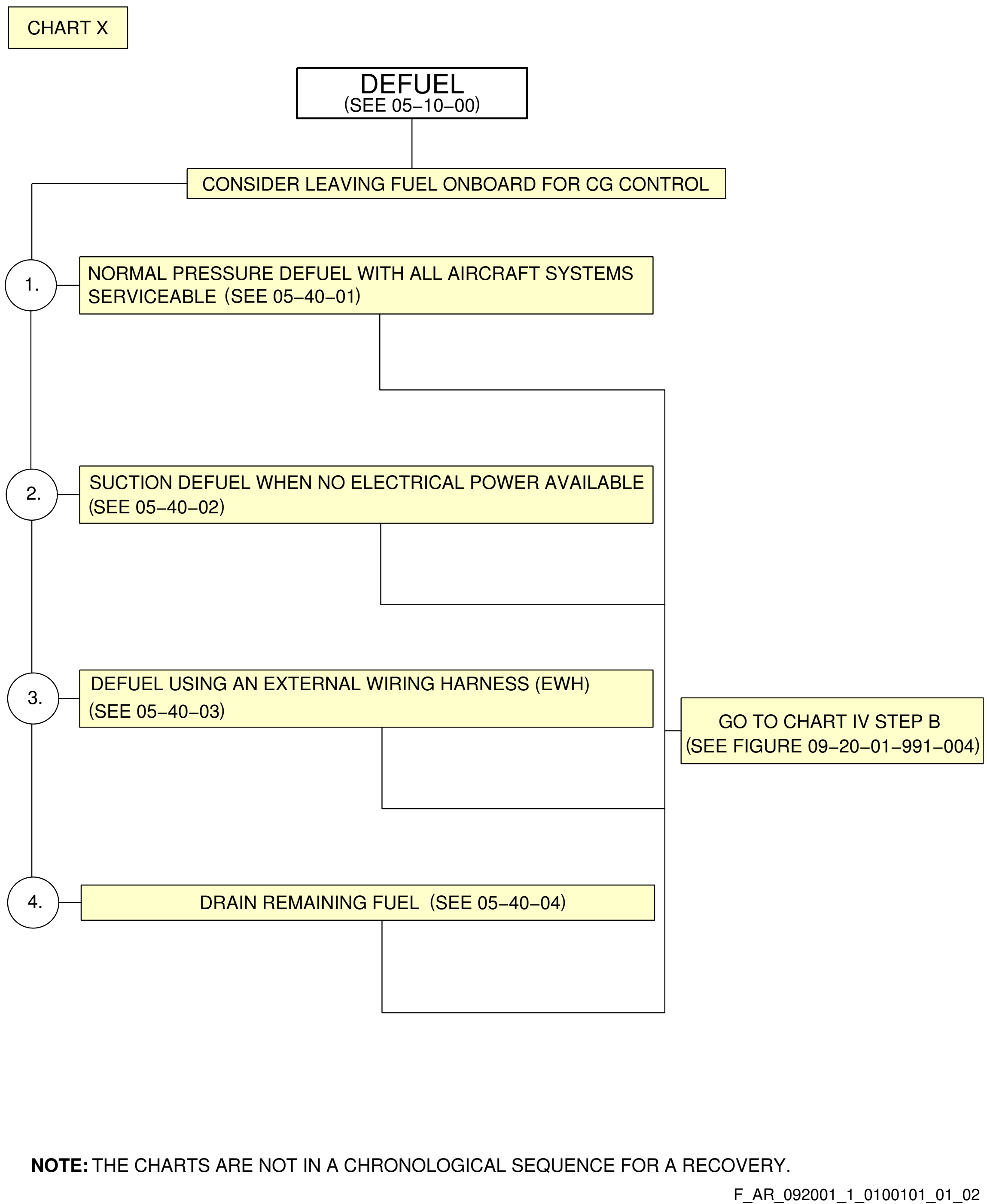
Aircraft Recovery Logic Chart
Chart VIII
FIGURE-09-20-01-991-008-A01

**ON A/C A330-200 A330-300



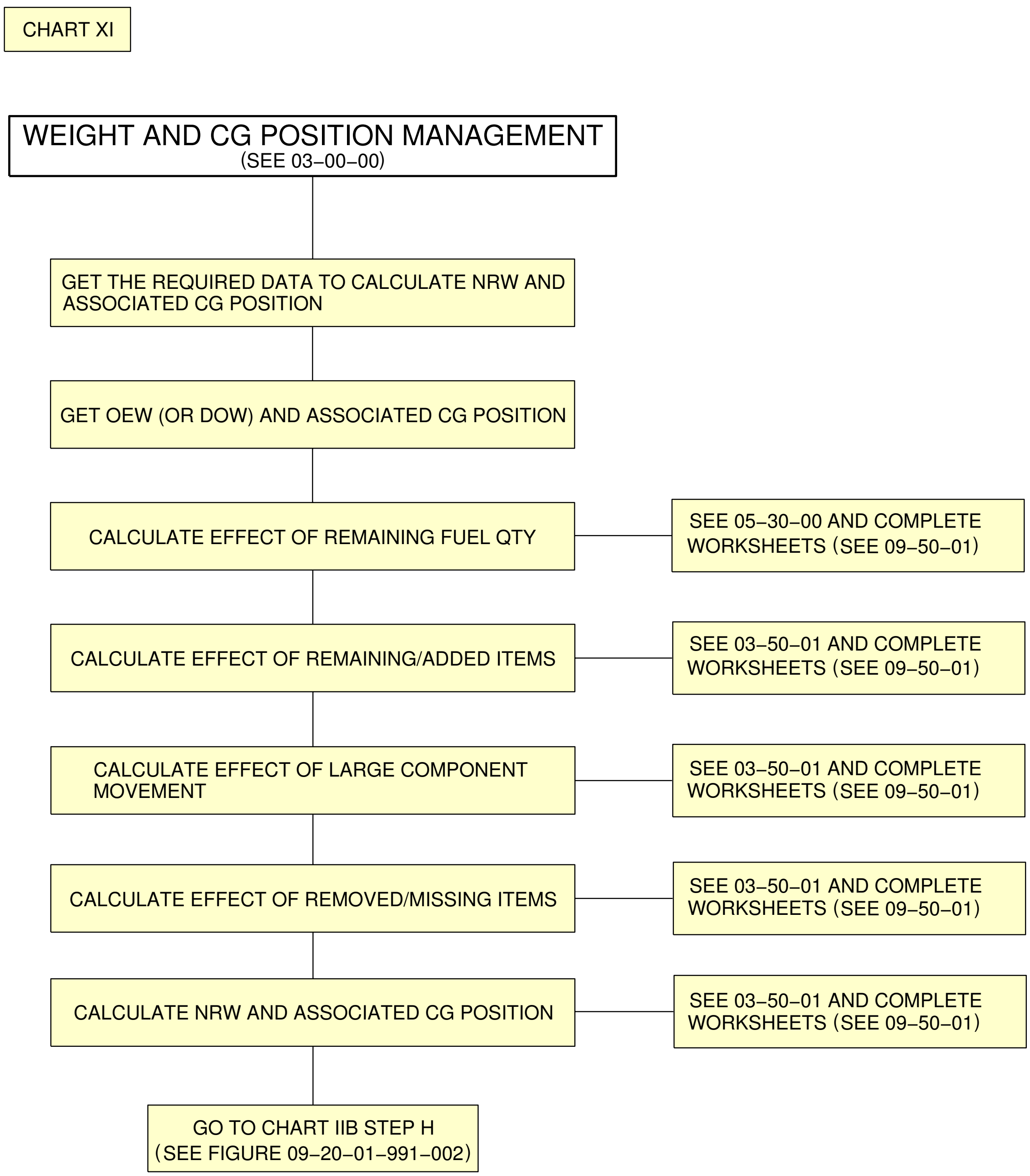
Aircraft Recovery Logic Chart
Chart IX
FIGURE-09-20-01-991-009-A01

**ON A/C A330-200 A330-300



Aircraft Recovery Logic Chart
Chart X
FIGURE-09-20-01-991-010-A01

**ON A/C A330-200 A330-300



NOTE: THE CHARTS ARE NOT IN A CHRONOLOGICAL SEQUENCE FOR A RECOVERY.

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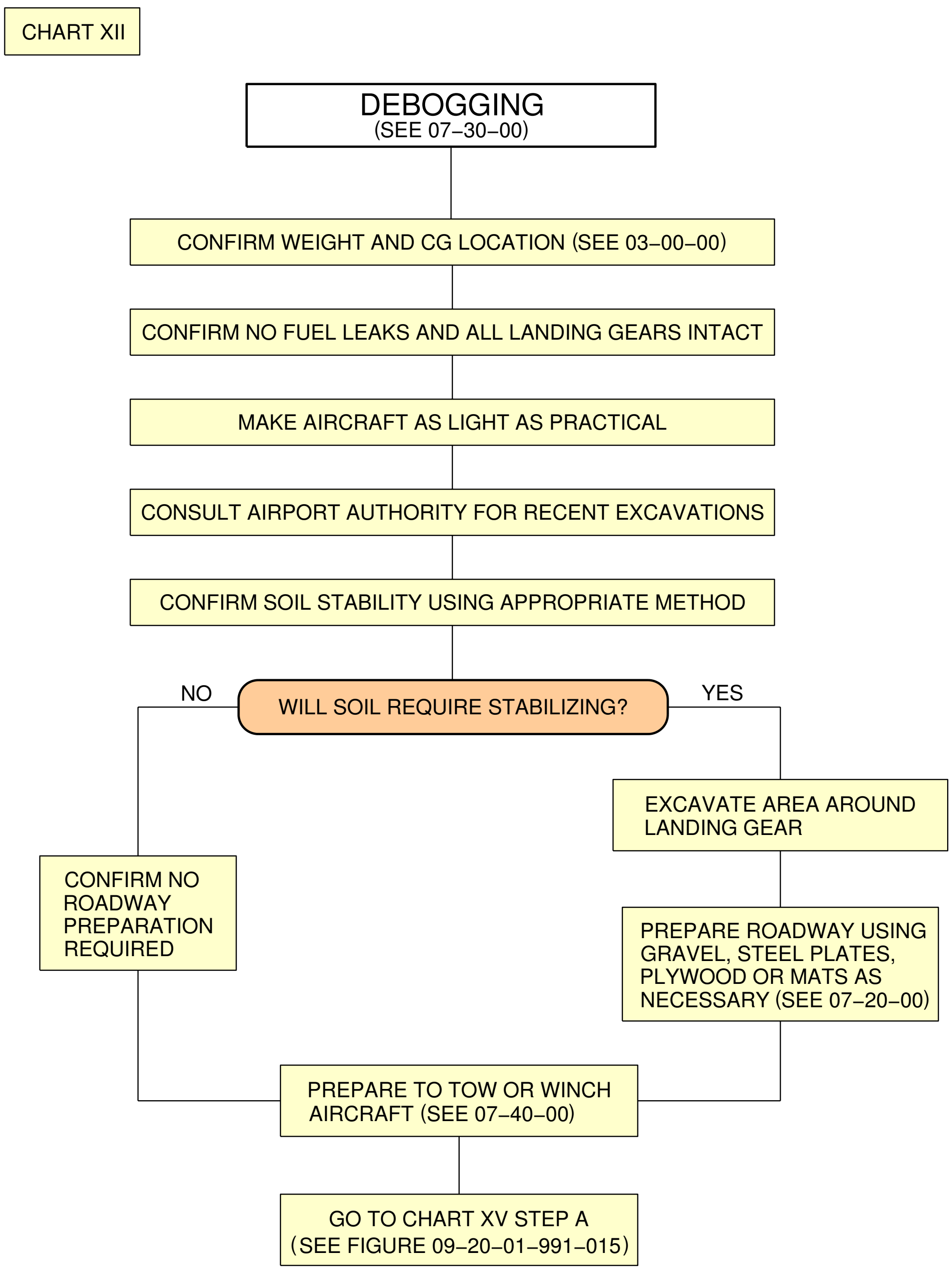
Aircraft Recovery Logic Chart
Chart XI
FIGURE-09-20-01-991-011-A01

**ON A/C A330-200 A330-300



NOTE: THE CHARTS ARE NOT IN A CHRONOLOGICAL SEQUENCE FOR A RECOVERY.

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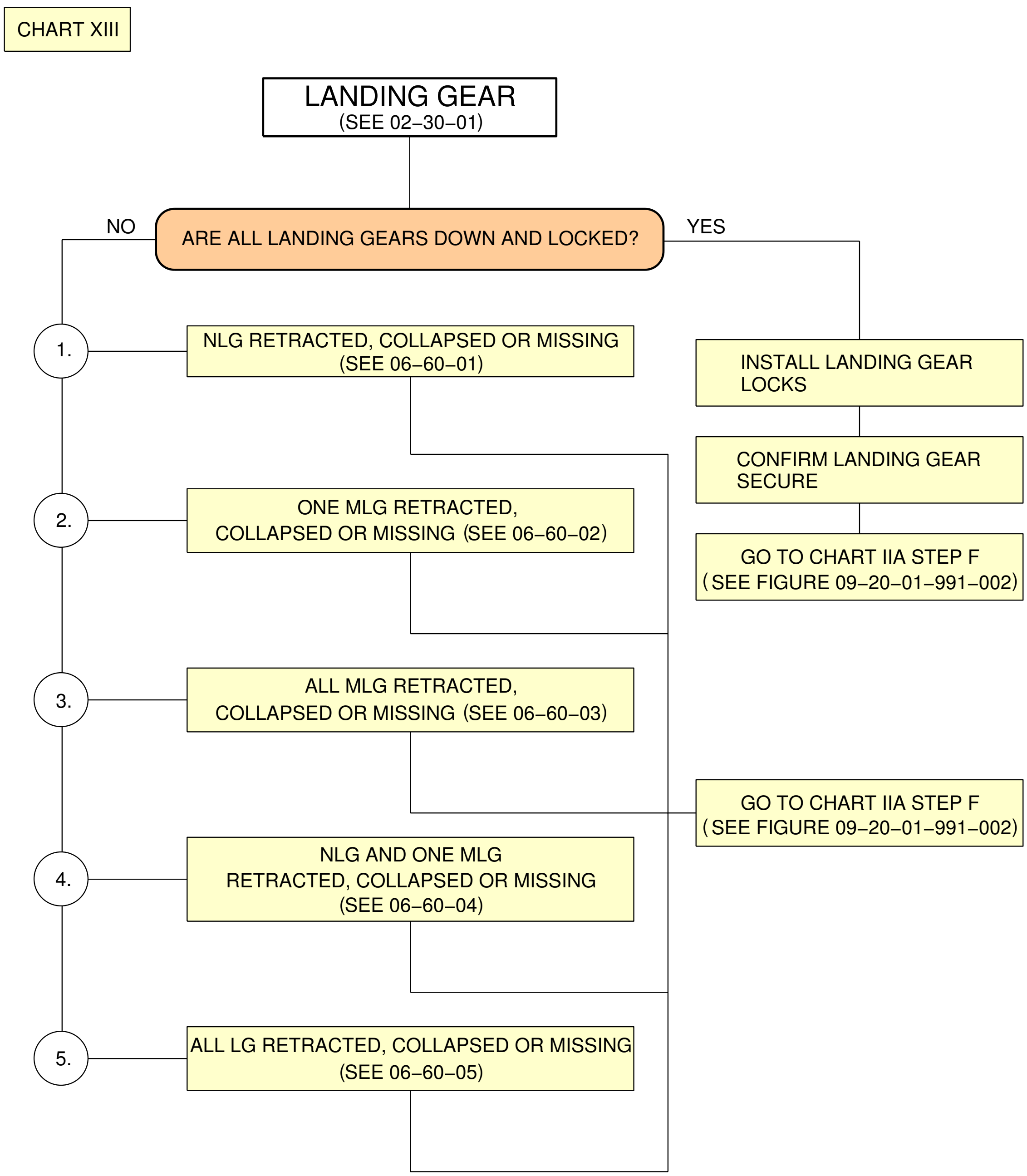
Aircraft Recovery Logic Chart
Chart XII
FIGURE-09-20-01-991-012-A01

**ON A/C A330-200 A330-300



NOTE: THE CHARTS ARE NOT IN A CHRONOLOGICAL SEQUENCE FOR A RECOVERY

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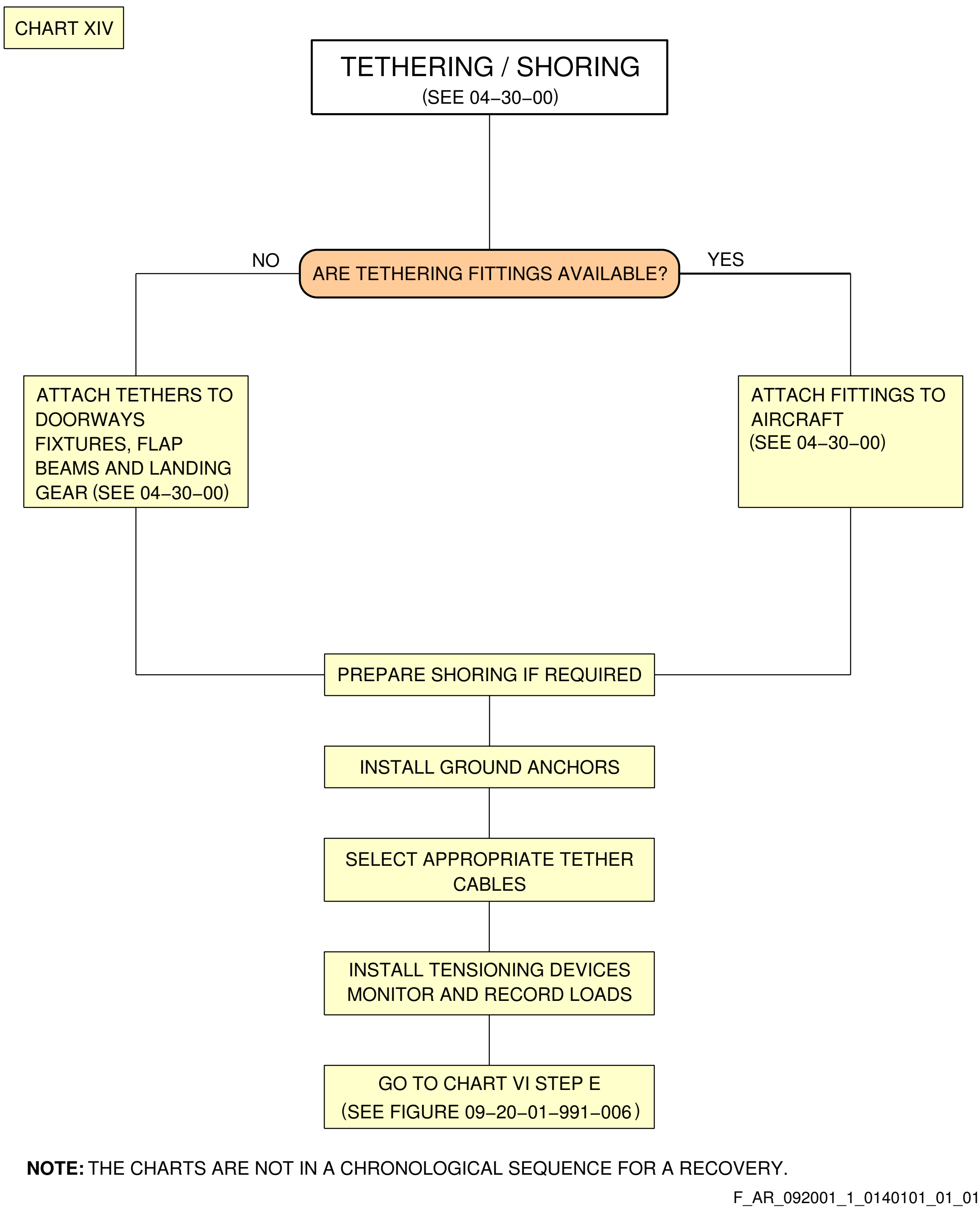
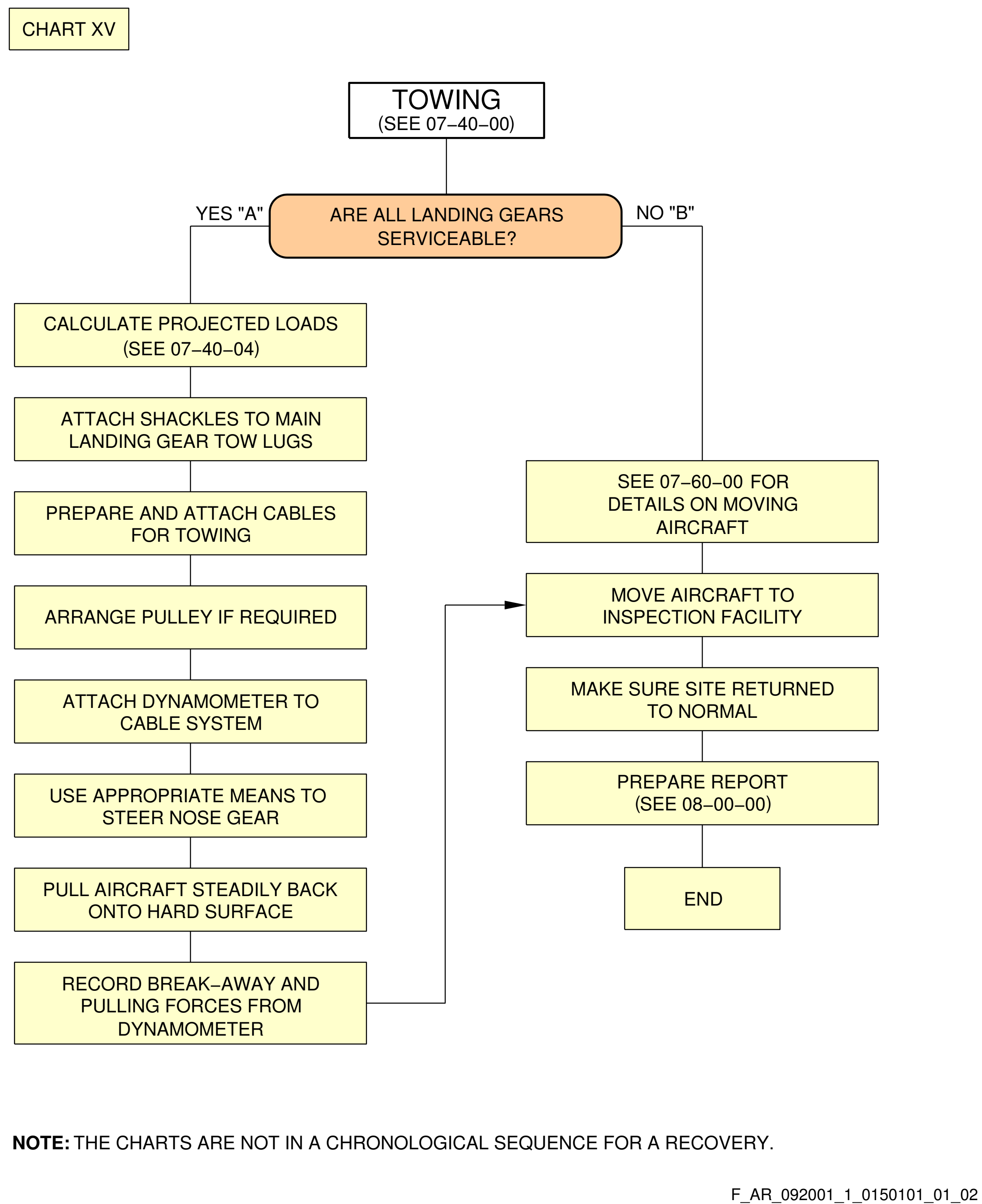
Aircraft Recovery Logic Chart
Chart XIII
FIGURE-09-20-01-991-013-A01

**ON A/C A330-200 A330-300



Aircraft Recovery Logic Chart
Chart XIV
FIGURE-09-20-01-991-014-A01

**ON A/C A330-200 A330-300



Aircraft Recovery Logic Chart
Chart XV
FIGURE-09-20-01-991-015-A01

****ON A/C A330-200 A330-300**

DESC 09-20-01-004-A01

Airline Aircraft Recovery Process Document

1. Airlines should consider the preparation of an internal Aircraft Recovery Process Document. This document will help the airline to prepare for an aircraft recovery, because it will contain full instructions about how to organize and prepare for a good recovery.
   It must give the steps on how each airline can do an aircraft recovery, from the time an incident is notified, to the movement of the aircraft to an inspection or repair facility.
   Help to prepare a process document of this type is available if you contact the IATA Aircraft Recovery Working Group at the website that follows:
   - http://www.iata.org

   NOTE : This chapter gives references to web sites for information only. Airbus shall not be held liable for web site or document content and for update or change of addresses.

   A. Proposed Coverage

      (1) The goals of the Aircraft Recovery Team, these should be clearly stated. Some ideas to include are:
         - How the Recovery Team can react,
         - What authority the Recovery Team has,
         - The promotion of aircraft recovery awareness,
         - How to share aircraft recovery data with the manufacturer, other operators and special interested groups,
         - Coordination of resources.

      (2) A current and up-to-date list of the Recovery Team Managers and Recovery Team Leaders.
      This must include office, home, fax, pager and cell phone numbers. The same information should be available for all other members of the recovery team.

      (3) A list of applicable aircraft to recover by the Recovery Team.
      This could include aircraft owned or leased by the airline and aircraft from subsidiary airlines and/or contracted airlines.

      (4) Procedures to follow when there is a known incident.
      These must highlight the need to keep and record all important data.

      (5) Current list of applicable government agencies with contact numbers.

      (6) How each team member can prepare.
      This must include suggestions on what items of clothing and equipment should be available in a personal "go kit". Vaccinations and visas should also be done.

      (7) A full list of airline support staff and contact numbers.
      This should include structural and power plant engineering staff, tooling and equipment technicians, weight and balance, purchasing and logistic personnel.

(8) A current and full list of all company-owned aircraft recovery equipment.
This should include the location, size and weight of all containers in where the equipment is stored.

(9) A current copy of the IATP D/E pools ground handling equipment, ground maintenance equipment and aircraft recovery kits.
These data are now available at the website that follows:
- http://www.iatp.com

NOTE : IATP website and recovery kits are available for IATP members only.

NOTE : This chapter gives references to web sites for information only. Airbus shall not be held liable for web site or document content and for update or change of addresses.

(10) A list of the local availability of general aircraft recovery materials and equipment. made by the company.
This list should include materials and equipment such as plywood and steel sheets, crushed rock, cribbing, cranes, heavy equipment etc.
You can be prepare this list with the ICAO Removal of disabled aircraft Document 9137-AN/898 as a guide.

(11) An Aircraft Recovery Manual (ARM) for each fleet type operated and its storage locations.

(12) The size of the cargo doors of each fleet type operated.
This will helps to move equipment if the incident is at a different airport.

(13) A list of all company-owned tooling, that includes recovery tooling such as pneumatic lifting bags, jacks, slings, etc.
This can include their location and properties such as capacity, compressed and extended heights, arc movement capability, etc.

**ON A/C A330-200 A330-300

DESC 09-20-01-005-A01

Off Runway Incident Reporting Proforma

1. General
This "Off-Runway" Incident Form is designed to support the evaluation of "off runway" in-service incidents. It helps to make technical judgement and to decide the quickest disposition of actions necessary to return the aircraft landing gear to service.

**ON A/C A330-200 A330-300

EACH "OFF−RUNWAY" INCIDENT COMPRISES UNIQUE CIRCUMSTANCES
WHICH REQUIRE INDIVIDUAL ASSESSMENT AND DISPOSITION.

THIS "OFF−RUNWAY" INCIDENT FORM IS DESIGNED TO SUPPORT THE
EVALUATION OF "OFF−RUNWAY" IN−SERVICE INCIDENTS. IT HELPS TO
MAKE TECHNICAL JUDGEMENT AND TO DECIDE THE QUICKEST DISPOSITION
OF ACTIONS NECESSARY TO RETURN THE AIRCRAFT LANDING GEAR TO SERVICE.

FILL IN ALL SECTIONS AS FULLY AS POSSIBLE AND SUPPLY AS MANY
PHOTOGRAPHS AS POSSIBLE TO SHOW THE INCIDENT

AIRLINE

DATE AND (LOCAL) TIME OF INCIDENT

AIRPORT

AIRCRAFT TYPE INCLUDING DASH NUMBER

AIRCRAFT REGISTRATION

MSN

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Off Runway Proforma
Introduction (Sheet 1 of 9)
FIGURE-09-20-01-991-020-A01

**ON A/C A330-200 A330-300

SECTION 1

SUPPLY PHOTOGRAPHS TO SHOW THE INCIDENT. THESE MUST INCLUDE VIEWS OF THE TAXIWAY, RUNWAY, AIRPORT, BUILDINGS AND THE POSITIONS OF ALL OBSTACLES THAT THE AIRCRAFT TOUCHED DURING THE INCIDENT. YOU MUST ALSO SHOW THE PATH OF THE LANDING GEAR. SHOW THE CROSS SECTION OF THE RUNWAY AND THE ADJACENT GROUND THAT THE AIRCRAFT MOVED ACROSS, WITH THE APPROXIMATE DIMENSIONS OF ALL STEPS AND GRADIENTS.
GIVE THE APPROXIMATE DISTANCES AND TRAJECTORY OF THE AIRCRAFT DURING THE INCIDENT, WITH THE ATTITUDE OF THE AIRCRAFT AFTER THE INCIDENT.

SUPPLY PHOTOS TO SHOW THE ITEMS BELOW :

– THE APPLICABLE LANDING GEAR (THE TWO SIDES, FRONT, REAR ELEVATIONS AND ALL AREAS OF DAMAGE) BEFORE AND AFTER RECOVERY
– THE AIRCRAFT BEFORE RECOVERY IN ITS REST POSITION OFF THE RUNWAY.
– THE TRACKS MADE BY EACH LANDING GEAR OFF THE RUNWAY AND ALL SKID MARKS ON THE RUNWAY
– RECOVERY OF THE AIRCRAFT

F_AR_092001_1_0200112_01_00

Off Runway Proforma
Section 1 (Sheet 2 of 9)
FIGURE-09-20-01-991-020-A01

**ON A/C A330-200 A330-300

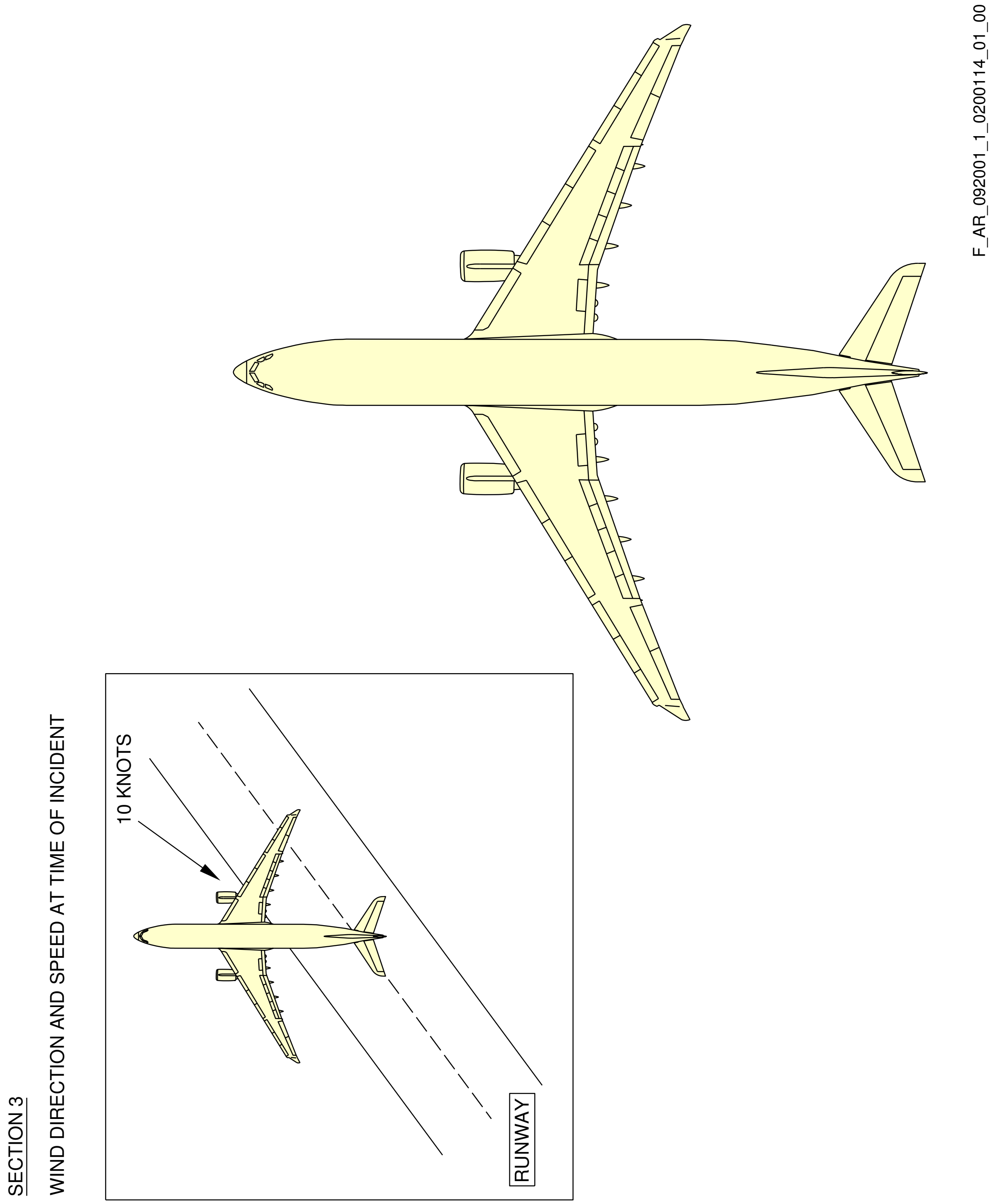
F_AR_092001_1_0200113_01_00

SECTION 2

DETAILED WRITTEN DESCRIPTION OF "OFF–RUNWAY" INCIDENT

Off Runway Proforma
Section 2 (Sheet 3 of 9)
FIGURE-09-20-01-991-020-A01

**ON A/C A330-200 A330-300



Off Runway Proforma
Section 3 (Sheet 4 of 9)
FIGURE-09-20-01-991-020-A01

**ON A/C A330-200 A330-300

SECTION 4 – METRICS

(A) APPROXIMATE AIRCRAFT WEIGHT__________METRIC TONNES OR__________IMPERIAL TONS

(B) AIRCRAFT CENTER OF GRAVITY________METERS FROM CENTERLINE OR________FEET FROM CENTERLINE OR________%MAC

(C) FLIGHT PHASE OF AIRCRAFT AT TIME OF INCIDENT–TICK APPROPRIATE PHASE

LOW SPEED TAXIING / MANEUVERING ☐ HIGH SPEED TAXIING–TAKE–OFF ☐ HIGH SPEED TAXIING–LANDING ☐

TOUCH DOWN ☐ TOWING (WITH TOWBAR) ☐ TOWING (TOWBARLESS) ☐ OTHER ___________

(D) DISTANCE RUN OFF RUNWAY BY EACH GEAR (I.E. TRACK LENGTH MADE BY EACH GEAR).

NLG______METERS RHMLG______METERS LHMLG______METERS

OR

NLG______FEET RHMLG______FEET LHMLG______FEET

(E) APPROXIMATE AIRCRAFT GROUND SPEED AS FUNCTION OF INCIDENT TIME

AT BEGINNING OF INCIDENT________KNOTS AT END OF INCIDENT________KNOTS

TIME FROM START OF INCIDENT (FIRST GEAR OFF RUNWAY) TO AIRCRAFT AT REST________SECONDS DIFFICULT TO EVALUATE AT THE TIME OF SUCH AN EVENT

(F) RUNWAY / TAXIWAY SURFACE CONDITION–TICK AS APPROPRIATE

DRY ☐ DAMP ☐ WET ☐ FLOODED ☐ SNOW ☐ ICE ☐ OTHER________

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Off Runway Proforma
Section 4-1 (Sheet 5 of 9)
FIGURE-09-20-01-991-020-A01

**ON A/C A330-200 A330-300

(G) OFF–RUNWAY SURFACE NATURE AND CONDITIONS: TICK OR SPECIFY AS APPROPRIATE

(1) TYPE OF GROUND – SAND ☐ CLAY ☐ STONY ☐ OTHER__________

(2) NATURE OF SURFACE – FLAT ☐ UNDULATING ☐ STEPPED/BANKED ☐ OTHER__________

(3) CONDITION OF GROUND – DRY ☐ WET ☐ FLOODED ☐ SNOW ☐ ICE ☐

HARD ☐ SOFT ☐ WATER LOGGED ☐ OTHER______________________

(4) WEATHER CONDITIONS AT TIME OF INCIDENT – PLEASE GIVE DETAILS______________________

(5) VISIBILITY – DAY ☐ NIGHT ☐ VISIBILITY________________METERS

(H) WERE ANY OBSTACLES TOUCHED DURING THE INCIDENT – PLEASE TICK AS APPROPRIATE.

NONE ☐ RUNWAY LIGHTS ☐ KERB STONE ☐ DRAINAGE CHANNELS ☐ ROCKS ☐ HOLES, BURROW ☐

OTHER_______________________

SUPPLY DRAWING OR PHOTOGRAPH AND APPROXIMATE DIMENSIONS OF ANY OBSTACLES RUN OVER

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Off Runway Proforma
Section 4-2 (Sheet 6 of 9)
FIGURE-09-20-01-991-020-A01

**ON A/C A330-200 A330-300

(I) BRAKING APPLICATION

WERE BRAKES APPLIED DURING THE INCIDENT YES ☐ NO ☐

IF YES, AT WHAT POINT IN THE INCIDENT WERE THE BRAKES APPLIED________________________________

APPROXIMATE LENGTH OF ON–RUNWAY AND OFF–RUNWAY SKID MARKS IF APPLICABLE:

PLEASE SUPPLY PHOTOGRAPHS OF SKID MARKS IF APPLICABLE

ON–RUNWAY SKID MARK DISTANCE__________METERS OR __________FEET

OFF–RUNWAY SKID MARK DISTANCE__________METERS OR __________FEET

(J) WERE THRUST REVERSERS DEPLOYED DURING INCIDENT YES ☐ NO ☐

(K) APPROXIMATE AIRCRAFT VELOCITY IN 3 AXES

VERTICAL________m/s FORWARD________m/s LATERAL________m/s

OR SAME COMMENT AS ABOVE

VERTICAL________ft/s FORWARD________ft/s LATERAL________ft/s

(L) NLG STEERING ANGLE (FUNCTION OF TIME IF POSSIBLE) START________° FINISH________°

MAX DEVIATION OF NOSE WHEEL STEERING ANGLE RELATED TO DIRECTION OF TRAVEL.
DURING OFF–RUNWAY TRAJECTORY_____° AT REST_____°

(M) ENGINE THRUST, AT REST 0% ☐ 5% ☐ 10% ☐ OTHER%__________

DURING OFF–RUNWAY TRAJECTORY 0% ☐ 5% ☐ 10% ☐ OTHER%__________

(N) RESTING ATTITUDE OF AIRCRAFT OFF RUNWAY ROLL ______° PORT ☐ OR STARBOARD ☐

PITCH ______° NOSE DOWN ☐ OR NOSE UP ☐

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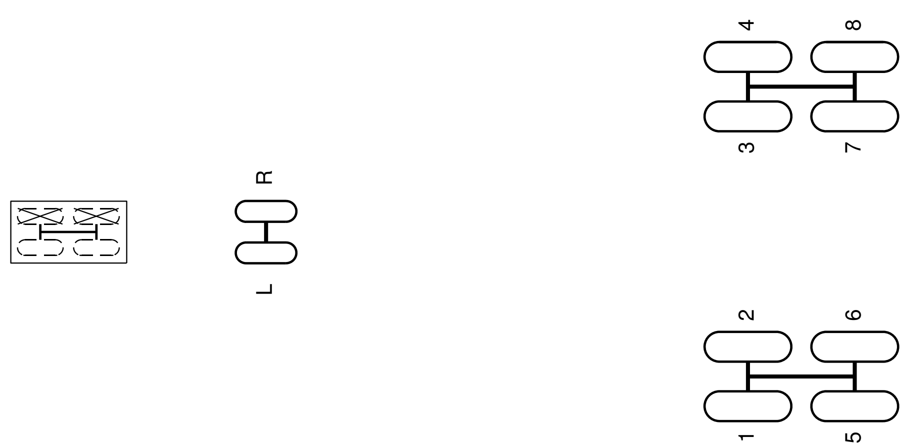
Off Runway Proforma
Section 4-3 (Sheet 7 of 9)
FIGURE-09-20-01-991-020-A01

**ON A/C A330-200 A330-300

SECTION 5

DEPTH AND NUMBER OF WHEELS IN GROUND: ENTER VALUES IN TABLE.
MARK WHEELS THAT RUN OFF–RUNWAY WITH A CROSS IN THE DIAGRAM BELOW, E.G.

WHEEL	DEPTH IN GROUND			
	IN RESTING ATTITUDE		DURING RUN OFF RUNWAY	
	mm	in	mm	in
1				
2				
3				
4				
5				
6				
7				
8				
L				
R				



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Off Runway Proforma
Section 5 (Sheet 8 of 9)
FIGURE-09-20-01-991-020-A01

****ON A/C A330-200 A330-300**

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SECTION 6

DESCRIPTION OF TNE RECOVERY (SUPPLY PHOTOGRAPHS):

Off Runway Proforma
Section 6 (Sheet 9 of 9)
FIGURE-09-20-01-991-020-A01

****ON A/C A330-200 A330-300**

TASK 09-20-01-869-801-A01

IATA Aircraft Recovery Quick Reference Check List

1. General
   This guide was prepared and given by the IATA Aircraft Recovery Working Group. It is a general guide and for use as a checklist during an aircraft recovery incident.
2. Inspections
   Not Applicable.
3. Job Setup References
   Not Applicable.
4. Procedure

   Subtask 09-20-01-869-001-A01

   A. Before you are on the site
      (1) Get the initial information about the incident.
      (2) Contact local airline/agent/own representative.
      (3) Prepare and make a selection of personnel/equipment/manuals.
      (4) Check availability of IATP-kits and order if necessary.

      NOTE : IATP website and recovery kits are available fort IATP members only.

   Subtask 09-20-01-869-002-A01

   B. When you are on the site
      (1) Make necessary contact with local security/fire fighting brigade to secure the site, and give area map.
      (2) Give careful instructions for an aircraft recovery plan.
      (3) Get necessary approval from local authorities to start the recovery operation.
      (4) Make sure:
         (a) Communication to/from site works correctly,
         (b) Transportation to/from site is possible,
         (c) Necessary accommodation and facilities can be available on site.
      (5) Contact local airlines, airport authorities and local suppliers for help with.
         (a) Heavy machinery/cranes, etc.
         (b) Access roads, building materials.
         (c) Timber/gravel/sand/steel plates, etc.

(d) Lighting equipment.

(6) Remove all necessary weight possible from the aircraft if needed.

(a) Make sure there are documents on restricted articles and hazardous material.

(b) Remove fuel and liquids if possible.

(c) Remove baggage and cargo if possible.

(d) Remove all unwanted and discarded material from the galleys and lavatories.

(7) Calculate the aircraft weight and CG.

(8) Make sure the recovery plan is still valid and all safety precautions have been taken.

(9) Remove all necessary aircraft components if needed.

(a) To lighten aircraft,

(b) To keep wind-induced loads to a minimum,

(c) To observe instructions from local authorities.

(10) Make preparation for

(a) Tethering/Shoring.

(b) Leveling/Lifting.

(c) Moving the aircraft.

(11) Prepare to put the aircraft in a hangar or to park it.

09-20-02 RECOVERY TEAM

****ON A/C A330-200 A330-300**

DESC 09-20-02-001-A01

Composition of the Recovery Team

1. General
   Airbus recommends that each airline:
   - Prepare an internal Aircraft Recovery Process document (see DESC 09-20-01-004-A01).
   - Make an Aircraft Recovery Team, with reference to this document.

   For this team, it is recommended:
   - To take the volunteers from the aircraft maintenance branch. These volunteers should have a strong interest in the aircraft recovery process and a good technical background.
   - That the members of the Aircraft Recovery Team stay a part of the team (even when they have promotions or move to different internal departments) so that their experience is not lost.

2. The Manager
   Airbus recommends that each Aircraft Recovery Team have a manager to control the activities of the Aircraft Recovery Team and any aircraft recovery incidents.

   A. The Manager should have:
      - Experience as an Aircraft Maintenance Production Manager with the related responsibilities,
      - Experience and/or knowledge related to aircraft recovery.

   B. The Manager should:
      - Supervise the Aircraft Recovery Team and their related activities,
      - Organize regular meetings and exercises with the Aircraft Recovery Team,
      - Be the interface with the airport, local and state authorities for aircraft recovery,
      - Represent his airline, on the International Airline Transport Association's (IATA), Aircraft Recovery Working Group (ARWG) and the International Airline Technical Pool (IATP) related to aircraft recovery.

3. Team Leaders
   Depending on the size of the airline, there can be one or more Team Leaders.

   A. The Team Leaders should have:
      - Experience as an Aircraft Maintenance Production Team Leader or Foreman,
      - Good technical and leadership qualities,
      - Experience and/or knowledge of aircraft recovery,
      - Good knowledge of jacks, pneumatic lifting bags and cranes.

   B. The Team Leaders should:
      - Report to the Aircraft Recovery Manager,
      - Control the company-owned aircraft recovery equipment and make sure that it is always serviceable,

- Make recommendations and suggestions related to the purchase of aircraft recovery equipment,
- Supervise the on-site aircraft recovery steps.

4. Structures Engineer and Systems Engineer
   The Structure Engineer and Systems Engineer should:
   - Analyze damage to the aircraft,
   - Prepare the drawings necessary for temporary repairs,
   - Help the Recovery Manager and Team Leader with decisions related to aircraft recovery.

5. Planner or Purchasing Agent
   The Planner or Purchasing Agent should:
   - Know how to get access to the nearest aircraft recovery kit,
   - Have contact information for local heavy equipment operators,
   - Know where to get general aircraft recovery materials,
   - Organize the leasing of equipment when necessary.

6. Licensed Aircraft Technicians
   The Licensed Aircraft Technicians should:
   - Have good technical knowledge,
   - Have a valid aircraft maintenance license for the specific aircraft type.
   - Report to the Aircraft Recovery Team Leader,
   - Do the specific aircraft maintenance tasks assigned by the Team Leader.

09-30 TOOLING AND EQUIPMENT

09-30-01 AIRCRAFT RECOVERY EQUIPMENT TOOLING AND MATERIALS

**ON A/C A330-200 A330-300

DESC 09-30-01-002-A01

General

1. General
   It can be necessary for operators to use tools during the recovery process.
   There are two categories of aircraft recovery tooling and equipment:
   - General recovery equipment
   - Specialized recovery equipment

   You can get these tools at the airport (contact the airport Authorities or IATP if you are a member), or locally (contact local vendors).

2. General Materials, Equipment and Tooling
   The general materials, equipment and tooling that follow are usually available locally (this is not a full list) :
   - Work lights, floodlights,
   - Ballast bags,
   - Sheets of plywood, steel plate, planking, etc.,
   - Cribbing timber (railroad ties) to make platforms,
   - Stones, gravel, broken asphalt to be compacted to make roadways,
   - Trailers and padded materials (mattresses, rubber padding, tires, sandbags) to move damaged aircraft,
   - Bulldozers, forklifts, crane, winching vehicles, excavators,
   - Towing tractor,
   - Cables, ropes, pulley blocks, ladders,
   - Mobile shelter-trailer, commercial transport equipment,
   - Wooden/steel beams,
   - Flatbed trucks and trailers,
   - Pumps, hoses and storage for fuel and/or water,
   - Hand pump for manual doors opening/closing,
   - On-site communication equipment (telephones, faxes, interphone headsets),

   An electrical or air power supply can be necessary for some of these tools. Thus, other equipment can be necessary:
   - Mobile electrical power unit (min. 5 kW),
   - Mobile air power unit (min. 7 bar (102 psi)).

   NOTE : The ICAO Airport Services Manual, part 5, Document 9137-AN/898, "Removal of Disabled Aircraft" gives a list of recommended materials and equipment.

3. Lifting and Tethering Material
The general materials, equipment and tooling that follow will be useful for the lifting and tethering of the aircraft.

A. Slings/straps - Nylon, Dacron, Carbon Fiber
These slings/straps are moisture and mildew resistant. As they dry quickly, it is possible to put them into storage a short time after use.
You can get them in almost all widths and lengths with different end attachments. You can get nylon straps/slings with single or double strength with single or multiple bands.
All these slings/straps help prevent damage to the aircraft skins when you lift the aircraft at the forward fuselage. But it is important to protect the straps from sharp edges and small radiuses.
Make sure that the slings/strap has a label, which gives the rate loads.
Do an inspection of the straps before you use them.

B. Wire Rope
Usually, a 6X19 type rope made from improved plow strength steel is used for recovery operations.

C. Chain
All types of hoisting chains made from good quality material will give very good results.

D. Rope - Manila, Nylon, Polypropylene
There are good general-purpose ropes but they are not recommended for lifting or tethering tasks.

09-30-02 AIRCRAFT RECOVERY TOOLING

****ON A/C A330-200 A330-300**

DESC 09-30-02-001-A01

General

1. Table 1 gives the list of tools referenced in the ARM.

   NOTE : Any comparable equipment may be used provided that it satisfies the requirements of the procedure. Other conventional suppliers of recovery material can provide items of the kits set.

PART NUMBER	NOMENCLATURE	VENDOR/ SUPPLIER	REFERENCES
460007174	PIN - GROUNDLOCK, MLG		TASK 02-30-01-481-802-A02
97A28002117002	PURGING TOOL		TASK 05-40-04-650-802-A01
97F32001001000	CONTROL UNIT-LEG FREE FALL ACTUATOR		TASK 04-80-20-867-801-A01
98A28104000000	PURGING TOOL - WATER DRAIN		TASK 03-20-02-970-801-A01 TASK 05-40-04-650-802-A01
98A52008509000	SLING-UNIVERSAL, DOORS		TASK 04-80-13-869-801-A01
98A52307628000	LOCK - SAFETY, CARGO DOOR ACTUATORS		TASK 04-80-13-869-801-A01
98F07103500001	ADAPTOR-JACK NOSE		TASK 06-30-00-581-802-A01
98F07104000002	PAD-JACKING, SET-WING		TASK 06-30-00-581-802-A01
98F07108635000	ADAPTER - JACKING, AFT JACKING POINT		TASK 06-30-00-581-802-A01
98F07203000	MOORING FITTING		DESC 04-30-00-001-A01
98F09101002000	CABLE, TOWING-MLG		TASK 07-40-02-584-801-A01
98F09103500000	CABLE, TOWING-MLG		TASK 07-40-02-584-801-A01
98F10201000000	MOORING KIT		TASK 04-30-00-556-801-A01
98F32104013000	COLLAR-SAFETY, MLG DOOR		TASK 02-30-01-481-802-A02
98F32104022000	DRIVE-SPLINED		TASK 04-80-20-867-801-A01
98F32204001001	COLLAR-SAFETY, NLG DOOR		TASK 02-30-01-481-802-A02
98F52308227002	STRUT - SUPPORT, CARGO DOOR		TASK 04-80-13-869-801-A01
98F52308279000	BAR - R/I ACTUATOR		TASK 04-80-13-869-801-A01
D23156000	PIN-SAFETY		TASK 07-40-01-584-802-A01 TASK 07-40-02-584-801-A01 TASK 07-40-01-584-801-A01
D23304000	PIN - GROUNDLOCK, NLG		TASK 02-30-01-481-802-A02
D97B00-003	MECHANICAL - ACTUATOR		TASK 05-40-03-650-802-A01 TASK 05-40-02-650-801-A01
GSE	NLG WHEEL JACK		TASK 02-30-01-867-803-A01

PART NUMBER	NOMENCLATURE	VENDOR/ SUPPLIER	REFERENCES
GSE	MLG WHEEL JACK		TASK 02-30-01-867-803-A01

Tools and Equipment

TABLE 1

09-30-03 IATP AIRCRAFT RECOVERY KITS

****ON A/C A330-200 A330-300**

DESC 09-30-03-001-A01

General

1. IATP Recovery Kits
The International Airline Technical Pool provides a number of aircraft recovery kits at strategic locations around the world.
Currently, there are ten of these kits and they are maintained by provider airlines.

NOTE : The kits are also available on a rental basis to non-member operators.
Information on kits content, purpose, capability, providers locations etc. should be available from:

- http://www.iatp.com

NOTE : IATP website and recovery kits are available for IATP members only.

NOTE : This chapter gives references to web sites for information only. Airbus shall not be held liable for web site or document content and for update or change of addresses.

2. Location of the Main Kits
Current locations of the IATP kits and their provider are given in Table 1 :

London, England	LHR	British Airways
Paris, France	ORY	Air France
Johannesburg, South Africa	JNB	South Africa Airways
Tokyo, Japan	NRT	Japan Airlines
New York, USA	JFK	Delta Airlines
Chicago, USA	ORD	American Airlines
Los Angeles, USA	LAX	American Airlines
Honolulu, USA	HNL	United Airlines
Sydney, Australia	SYD	Quantas Airlines
Mumbai, India	BOM	Air India

IATP Recovery Kits

TABLE 1

The Table 2 gives details on kit suppliers and contacts.

COMPANY	CODE	KIT LOCATION	GIVEN NAME	FAMILY NAME	SITA CODE	MAILING ADDRESS
American Airlines	AA	LAX ORD	Julie	McClain	HDQTPAA	American Airlines 3800 N. Mingo Rd. MD 523 Tulsa OK 74158
Air France	AF	ORY	Philippe	Guillem	ORYJOAF	Air France Orly Sud 124 F-94396 Orly Aerogare Cedex
Air India	AI	BOM	KG	Shekar	BOMELAI	Air India Line Stations, Engineering Dept Old Airport KALINA MAHARASTRA 400029 INDIA
British Airways	BA	LHR	Brian	Deacon	LHRKEBA	British Airways PLC BA Maintrol 3rd Floor Europe House Waterside, PO Box 365 HARMONDSWORTH WEST DRAYTON UB7 0GB
Delta Airlines	DL	JFK	Terry	Lucas	ATLTEDL	Delta Airlines P.O. BOX 20706 ATLANTA GA 30320 USA
Japan Airlines	JL	NRT	Satoru	Arasaki	TYOJPJL	Japan Airlines 3-5-1, HANEDA AIRPORT M1 BLDG OTA-KU TOKYO 144-0041
Qantas	QF	SYD	Jean-Marie	L'Eveille	SYDEDQF	Qantas Airways Ltd Sydney Distribution Center SYDSDC/1 263-271 Coward Road Mascot N.S.W 2020 AUSTRALIA

COMPANY	CODE	KIT LOCATION	GIVEN NAME	FAMILY NAME	SITA CODE	MAILING ADDRESS
South African	SA	JNB	Charlie	Haman	JNBMPSA	South African South Africa Airways Technical Technical Area JOHANNESBURG International Airport
United Airlines	UA	HNL	Connie	Showalter	SFOPSUA	United Airlines S.F. Maintenance Base- SFOUS San Francisco International Airport SAN FRANCISCO CA 94128 USA

Kit Suppliers and Contacts

TABLE 2

**ON A/C A330-200 A330-300

DESC 09-30-03-002-A01

Example of IATP Recovery Kit

1. This section gives an example of an IATP recovery kit that can be found at main airports. It is only an example and does not reflect the exact content of all main IATP kits.
Table 1 gives an example of basic recovery kit.
Table 2 gives an example of supplementary kit.

Quantity	Description
90	PNEUMATIC BAGS (SINGLE ELEMENT)
1	MASTER CONTROL CONSOLE
5	REMOTE CONTROL CONSOLE
5	AIR DISTRIBUTORS
6	MANIFOLD (CONTROL CONSOLE)
85	PNEUMATIC HOSES
6	WINCHES
6	WIRE ROPES
6	EARTH ANCHORS
16	PLASTIC FOAM PROTECTION PADS (50 mm (2 in) thick)
1	ROLL POLYTHENE SHEET (500 gauge, 7.3 m (287 in) wide)
1	AIR COMPRESSOR
2	REGENT TRIPOD CRASH JACKS Capacity - 710 mm (28 in) to 1730 mm (68 in), 80 tons Capacity - 1730 mm (68 in) to 3560 mm (140 in), 100 tons
1	COMPRESSOR SPARES AND BAG REPAIR KIT

Basic Recovery Kit

TABLE 1

Quantity	Description
2	PNEUMATIC BAGS
2	PNEUMATIC HOSE REELS
4	MANIFOLD CONTROL CONSOLE / AIR CONTROL CONSOLE WITH 10 OUTLETS
4	PROTECTION PADS

Quantity	Description
4	WIRE ROPE (CAPACITY OF TOWING A CODE E/F AIRCRAFT)
2	BODY LIFTING SLING (CAPACITY OF LIFTING A CODE E/F AIRCRAFT)
1	AIR COMPRESSOR (FOR SYNCRO JACKS)
2	SPREADER BARS (INCLUDES SLINGS AND SHACKLES)
1	AIR COMPRESSOR

Supplementary Recovery Kit

TABLE 2

09-50 CALCULATION WORKSHEETS

09-50-01 WEIGHT AND CG CALCULATION WORKSHEETS

****ON A/C A330-200 A330-300**

DESC 09-50-01-001-A01

Worksheets

1. General

   It is necessary to use these worksheets in relation with chapter 03-50-01.

   A. Interim Worksheet:
      - Fuel Remaining on Board Effect. See FIGURE 09-50-01-991-001-AFIGURE 09-50-01-991-001-B.
      - Cargo and Baggage Remaining Effect. See FIGURE 09-50-01-991-002-A.
      - Total Traffic Load Remaining Effect. See FIGURE 09-50-01-991-003-A.
      - Ballast Added Effect. See FIGURE 09-50-01-991-004-B.
      - Waste Water Remaining Effect. See FIGURE 09-50-01-991-005-A.
      - Non OEW Catering Equipment Added Effect. See FIGURE 09-50-01-991-006-A.
      - Large Component Movement Effect. See FIGURE 09-50-01-991-007-A.
      - Potable Water Removed Effect. See FIGURE 09-50-01-991-008-A.
      - Cockpit and Cabin Crew Removed Effect. See FIGURE 09-50-01-991-009-A.
      - Catering Equipment Removed Effect. See FIGURE 09-50-01-991-010-A.
      - Large Component Removed/Missing Effect. See FIGURE 09-50-01-991-011-A.
      - Hydraulic Fluids Removed Effect. See FIGURE 09-50-01-991-012-A.

   B. NRW & Related H & Y Moment Worksheets
      - NRW & Related H, & Y Moment Worksheet Calculation from OEW. See FIGURE 09-50-01-991-013-A.
      - NRW & Related H, & Y Moment Worksheet Calculation from DOW. See FIGURE 09-50-01-991-014-A.

**ON A/C A330-200

	WEIGHT (kg or lb)		MOMENT Weight x H–arm (kgm or lb.in)		MOMENT Weight x Y–arm (kgm or lb.in)	
	TO SUBTRACT	TO ADD	TO SUBTRACT	TO ADD	TO SUBTRACT	TO ADD
LH OUTER TANK						
LH INNER TANK						
CENTER TANK						
TRIM TANK						
RH INNER TANK						
RH OUTER TANK						
TOTAL		Σ		Σ	Σ	Σ

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Interim Worksheet
Fuel Remaining on Board Effect
FIGURE-09-50-01-991-001-A01

**ON A/C A330-300

	WEIGHT (kg or lb)		MOMENT Weight x H–arm (kgm or lb.in)		MOMENT Weight x Y–arm (kgm or lb.in)	
	TO SUBTRACT	TO ADD	TO SUBTRACT	TO ADD	TO SUBTRACT	TO ADD
LH OUTER TANK						
LH INNER TANK						
TRIM TANK						
RH INNER TANK						
RH OUTER TANK						
TOTAL		Σ		Σ	Σ	Σ

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Interim Worksheet
Fuel Remaining on Board Effect
FIGURE-09-50-01-991-001-B01

**ON A/C A330-200 A330-300

	WEIGHT (kg or lb)		MOMENT Weight x H–arm (kgm or lb.in)		MOMENT Weight x Y–arm (kgm or lb.in)	
	TO SUBTRACT	TO ADD	TO SUBTRACT	TO ADD	TO SUBTRACT	TO ADD
TOTAL FORWARD CARGO REMAINING EFFECT						
TOTAL AFT CARGO REMAINING EFFECT						
TOTAL BULK CARGO REMAINING EFFECT						
TOTAL		Σ		Σ	Σ	Σ

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Interim Worksheet
Cargo and Baggage Remaining Effect
FIGURE-09-50-01-991-002-A01

**ON A/C A330-200 A330-300

	WEIGHT (kg or lb)		MOMENT Weight x H–arm (kgm or lb.in)		MOMENT Weight x Y–arm (kgm or lb.in)	
	TO SUBTRACT	TO ADD	TO SUBTRACT	TO ADD	TO SUBTRACT	TO ADD
TOTAL TRAFFIC LOAD REMAINING ON UPPER DECK EFFECT						
TOTAL		Σ		Σ		

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Interim Worksheet
Total Traffic Load Remaining Effect
FIGURE-09-50-01-991-003-A01

**ON A/C A330-200 A330-300

	WEIGHT (kg or lb)		MOMENT Weight x H–arm (kgm or lb.in)		MOMENT Weight x Y–arm (kgm or lb.in)	
	TO SUBTRACT	TO ADD	TO SUBTRACT	TO ADD	TO SUBTRACT	TO ADD
L/H WING BALLAST ADDED EFFECT						
R/H WING BALLAST ADDED EFFECT						
UPPER DECK BALLAST ADDED EFFECT						
FORWARD CARGO BALLAST ADDED EFFECT						
AFT CARGO BALLAST ADDED EFFECT						
BULK CARGO BALLAST ADDED EFFECT						
TOTAL		Σ		Σ	Σ	Σ

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Interim Worksheet
Ballast Added Effect
FIGURE-09-50-01-991-004-B01

**ON A/C A330-200 A330-300

	WEIGHT (kg or lb)		MOMENT Weight x H–arm (kgm or lb.in)		MOMENT Weight x Y–arm (kgm or lb.in)	
	TO SUBTRACT	TO ADD	TO SUBTRACT	TO ADD	TO SUBTRACT	TO ADD
WASTE WATER REMAINING IN TANK No 1 EFFECT						
WASTE WATER REMAINING IN TANK No 2 EFFECT						
TOTAL		Σ		Σ		

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Interim Worksheet
Waste Water Remaining Effect
FIGURE-09-50-01-991-005-A01

**ON A/C A330-200 A330-300

	WEIGHT (kg or lb)		MOMENT Weight x H–arm (kgm or lb.in)		MOMENT Weight x Y–arm (kgm or lb.in)	
	TO SUBTRACT	TO ADD	TO SUBTRACT	TO ADD	TO SUBTRACT	TO ADD
NON OEW CATERING EQUIPMENT ADDED EFFECT						
TOTAL		Σ		Σ		

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Interim Worksheet
Non OEW Catering Equipment Added Effect
FIGURE-09-50-01-991-006-A01

**ON A/C A330-200 A330-300

	WEIGHT (kg or lb)		MOMENT Weight x H–arm (kgm or lb.in)		MOMENT Weight x Y–arm (kgm or lb.in)	
	TO SUBTRACT	TO ADD	TO SUBTRACT	TO ADD	TO SUBTRACT	TO ADD
NLG RETRACTION EFFECT						
LH MAIN LG RETRACTION EFFECT						
RH MAIN LG RETRACTION EFFECT						
SLATS/FLAPS EXTENSION EFFECT						
TOTAL			Σ		Σ	Σ

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Interim Worksheet
Large Component Movement Effect
FIGURE-09-50-01-991-007-A01

**ON A/C A330-200 A330-300

	WEIGHT (kg or lb)		MOMENT Weight x H−arm (kgm or lb.in)		MOMENT Weight x Y−arm (kgm or lb.in)	
	TO SUBTRACT	TO ADD	TO SUBTRACT	TO ADD	TO SUBTRACT	TO ADD
TANK N°1 POTABLE WATER REMOVED EFFECT						
TANK N°2 POTABLE WATER REMOVED EFFECT						
TOTAL	Σ		Σ			

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Interim Worksheet
Potable Water Removed Effect
FIGURE-09-50-01-991-008-A01

**ON A/C A330-200 A330-300

	WEIGHT (kg or lb)		MOMENT Weight x H–arm (kgm or lb.in)		MOMENT Weight x Y–arm (kgm or lb.in)	
	TO SUBTRACT	TO ADD	TO SUBTRACT	TO ADD	TO SUBTRACT	TO ADD
COCKPIT CREW REMOVED EFFECT						
CABIN CREW REMOVED EFFECT						
TOTAL	Σ		Σ			

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Interim Worksheet
Cockpit and Cabin Crew Removed Effect
FIGURE-09-50-01-991-009-A01

**ON A/C A330-200 A330-300

	WEIGHT (kg or lb)		MOMENT Weight x H−arm (kgm or lb.in)		MOMENT Weight x Y−arm (kgm or lb.in)	
	TO SUBTRACT	TO ADD	TO SUBTRACT	TO ADD	TO SUBTRACT	TO ADD
CATERING EQUIPMENT REMOVED EFFECT						
TOTAL	Σ		Σ			

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Interim Worksheet
Catering Equipment Removed Effect
FIGURE-09-50-01-991-010-A01

**ON A/C A330-200 A330-300

	WEIGHT (kg or lb)		MOMENT Weight x H−arm (kgm or lb.in)		MOMENT Weight x Y−arm (kgm or lb.in)	
	TO SUBTRACT	TO ADD	TO SUBTRACT	TO ADD	TO SUBTRACT	TO ADD
LH WING COMPONENT REMOVED/ MISSING EFFECT						
RH WING COMPONENT REMOVED/ MISSING EFFECT						
FUSELAGE COMPONENT REMOVED/ MISSING EFFECT						
VERTICAL TAIL COMPONENT REMOVED/ MISSING EFFECT						
HORIZONTAL TAIL COMPONENT REMOVED/ MISSING EFFECT						
PYLON AND NACELLE COMPONENT REMOVED/ MISSING EFFECT						
LANDING GEARS COMPONENT REMOVED/ MISSING EFFECT						
TOTAL	Σ		Σ		Σ	Σ

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Interim Worksheet
Large Component Removed/Missing Effect
FIGURE-09-50-01-991-011-A01

**ON A/C A330-200 A330-300

	WEIGHT (kg or lb)		MOMENT Weight x H–arm (kgm or lb.in)		MOMENT Weight x Y–arm (kgm or lb.in)	
	TO SUBTRACT	TO ADD	TO SUBTRACT	TO ADD	TO SUBTRACT	TO ADD
TOTAL HYDRAULIC FLUIDS REMOVED EFFECT						
TOTAL	Σ		Σ			

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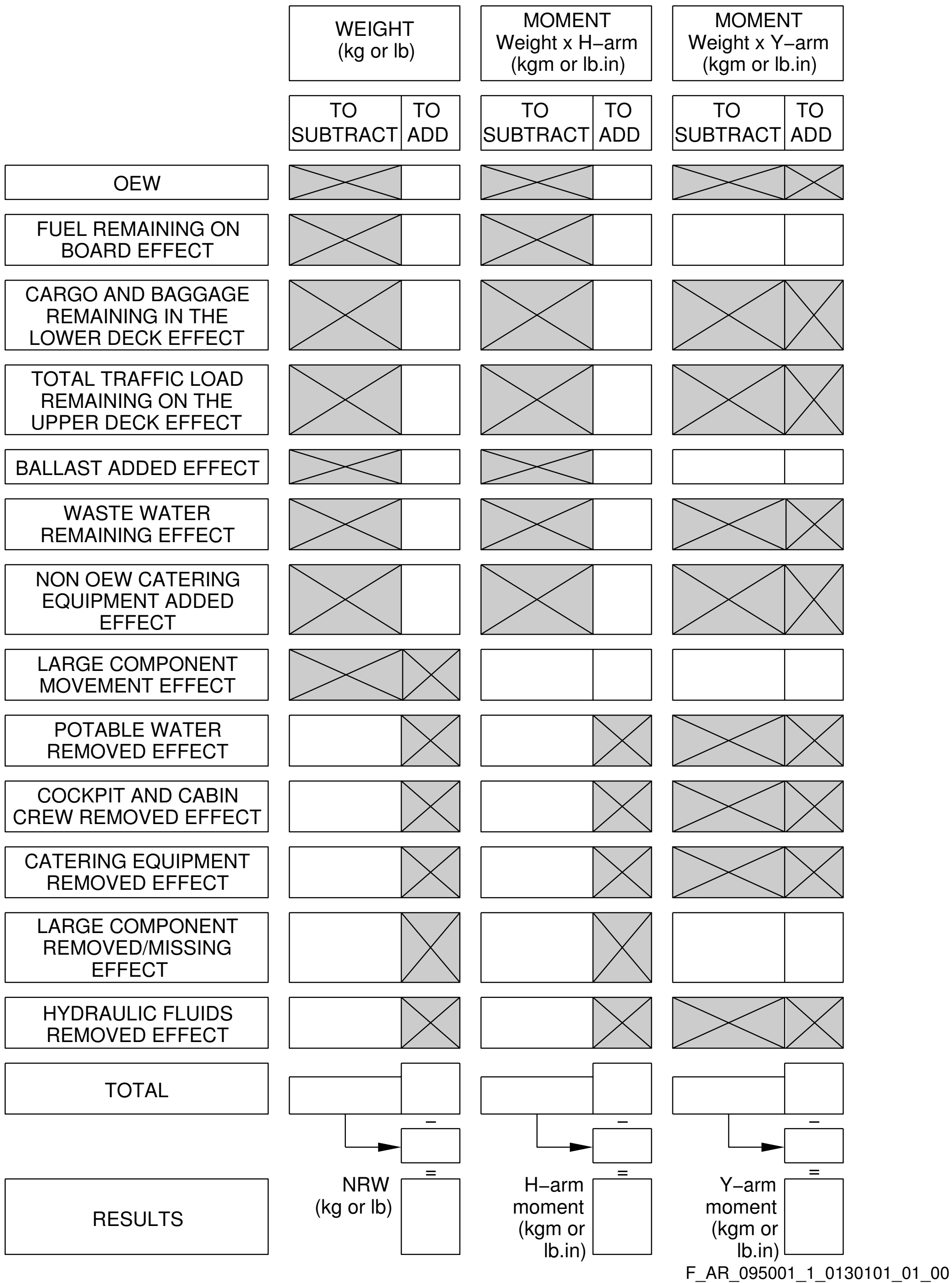
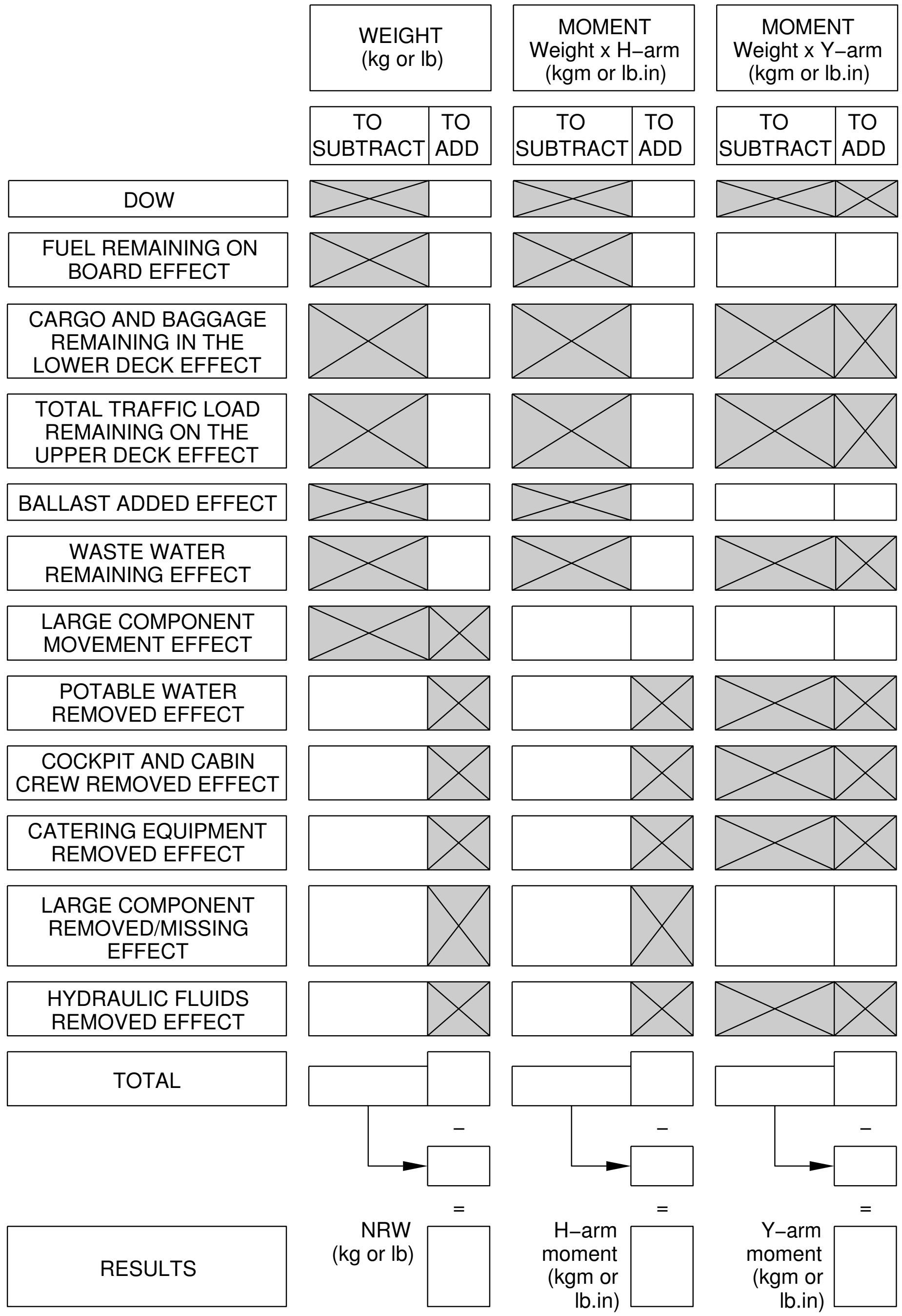
Interim Worksheet
Hydraulic Fluids Removed Effect
FIGURE-09-50-01-991-012-A01

**ON A/C A330-200 A330-300



NRW & Related H, & Y Moment Worksheets
NRW & Related H, & Y Moment Worksheet Calculation from OEW
FIGURE-09-50-01-991-013-A01

**ON A/C A330-200 A330-300



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NRW & Related H, & Y Moment Worksheets
NRW & Related H, & Y Moment Worksheet Calculation from DOW
FIGURE-09-50-01-991-014-A01