

System Bill of Materials for: 144034-RFX

| No# | Description | Quantity |
|--------|------------------------------|----------|
| 144008 | AC60-LP-IS SCALE (60KX10) | 20 |
| 144009 | AC60-LP AXLE SPACER | 8 |
| 144010 | AC60-LP AXLE SPACER B757 | 4 |
| 144011 | AC60-LP AXLE SPACER A340 | 6 |
| 144012 | AC60-LP RAMP | 10 |
| 144013 | AC60LP TIRE STOP | 10 |
| 145007 | AC60LP TRANSPORT CART 12 PAD | 2 |

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AIRCRAFT WEIGHING GUIDE



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NOTIFICATIONS

SAFETY SUMMARY

The following general safety precautions must be observed during all phases of operation, service, and repair of this scale. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the scale. Intercomp assumes no liability for the customer's failure to comply with these requirements.



WARNING: Due to danger of introducing hazards, do not substitute parts or perform any unauthorized modifications of the scale.

WARRANTY

INTERCOMP CORPORATION (hereafter called "the company") warrants the equipment that this document accompanies to be free of defects in materials and workmanship, and to operate according to design specifications for a period of one (1) year after receipt by the original purchaser. After authorized return to the company at the purchaser's expense, the company shall evaluate any returned equipment under warranty claim, and shall make such repairs or replacements as may be judged necessary, in as expeditious a manner as possible.

IN THE EVENT that the company determines the claim to be made as a result of improper use, abuse, modification, shipping damage, or other factors beyond the reasonable control of the company, the company will advise the purchaser of the estimated repair costs. The company makes no warranty other than that contained in this statement. No agent other than an executive officer of Intercomp Corporation is empowered to modify in any manner this statement of warranty.

COMPLIANCE WITH FCC RULES

The equipment will generate, use and radiate radio frequency energy. If this equipment is not installed and used in accordance with the information set forth in the support manual, it may cause interference to radio communications. This unit has been tested and has been found to comply with the limits for a Class A computing device pursuant to subpart J of part 15 of FCC Rules. These rules are designed to provide reasonable protection against interference when equipment is operated in a commercial environment. However, if this unit is operated in a residential area, it is likely to cause interference and under these circumstances the user will be required to take whatever measures are necessary to eliminate the interference at their own expense.

INTRODUCTION TO WEIGHING CONCEPTS

This section is intended to provide a basic familiarity with the weighing process and Intercomp weighing systems. The manual provides detailed descriptions on how to operate each component of the scale system as well as information about weight and balance control.



ATTENTION: It is important to follow the specific requirements of the aircraft manufacturer.

RELATIONSHIP BETWEEN MASS AND WEIGHT

WHAT IS WEIGHT?

Weight is related to mass. The mass of the earth will attract the mass of any object, producing a downward force referenced as weight. The amount of force applied is dependent on the location and altitude of the object. The downward force can be measured and translated into weight. It is important to note that a scale is a force measurement instrument. A scale does not measure mass directly.

GROSS, NET AND TARE VALUES

WHAT IS BEING WEIGHED?

There are three basic elements to weighing an object; Gross Weight, Net Weight and TARE Weight.

| CLASSIFICATION | DEFINITION |
|----------------|---|
| GROSS | The combined weight of the aircraft being weighed. Weight includes the aircraft and fixtures or tooling. |
| NET | The weight of the aircraft only. The NET weight is used in all calculations. |
| TARE | The weight of tooling, fixtures, shipping containers or anything used to position and hold the aircraft in place. |

INTRODUCTION TO WEIGHING CONCEPTS

ARMS, MOMENTS CENTER OF GRAVITY

WHERE IS THE WEIGHT LOCATED?

The purpose of weighing an aircraft is to determine the amount and location of the aircraft's mass. The location of the scales and weight read from the scales are combined with simple mathematical formulas to determine where the aircraft would balance if suspended at a single point. This point is known as the CENTER of GRAVITY or CG. The manufacturer designates the correct CG for the aircraft as referenced to the datum. Changes to the aircraft structure, equipment, fuel supply, and loading can affect the CG location.

A standard reference point is required for all measurements involving the aircraft. Each aircraft manufacturer designates a point on or near a specific type of aircraft as the standard reference point called the DATUM. The DATUM is generally a point some distance in front of the aircraft, although it may be located on the aircraft. The DATUM is used as the zero reference point for all longitudinal (front to rear) ARM measurements on the aircraft. Specifications for locating the DATUM must be physically located with the aircraft. DATUM specs can be found in the cockpit on a datum plate or included in the aircraft records. Manufacturers typically use the longitudinal centerline of the aircraft as the DATUM for lateral (side to side) ARM measurements. If a different lateral DATUM is specified, the location is referenced in the DATUM record.

ARM

The distance from the datum point to the scale is called an ARM, measured in inches or centimeters.

MOMENT ARM

The weight from the scale is multiplied by the ARM to calculate the MOMENT ARM. The preferred unit of measure for the MOMENT calculation is in*lb or cm*kg.

MOMENT calculations are combined and then divided by the total weight to determine the Center of Gravity.

Each aircraft has an aircraft record book that contains a listing of the CG locations. The weight record listing must be updated when any permanent changes are made to the aircraft.

INTRODUCTION TO AIRCRAFT WEIGHING

WEIGH PREPARATION

Aircraft must be weighed before the Center of Gravity can be calculated. Scales to be used to weigh the aircraft should be checked. The weighing site should be prepared and the aircraft must be brought to a standard configuration.

SITE PREPARATION

The weigh site floors should be level. While angled surfaces can be compensated for mathematically, level weigh surfaces are the best option.

The hangar must be free of drafts and stray wind currents. Air currents across the wings or tail may be detected as changes in weight. Ensure hangar doors are closed. Turn off all blowers and air conditioning during the weighing process.

AIRCRAFT PREPARATION

The aircraft must be prepared for weighing. A standardized checklist should be available from the aircraft manufacturer. Typically aircraft prep items include washing and drying the external surface, verifying tires are inflated correctly, struts are serviced, engines are serviced, aircraft de-fueled and all interior stations cleaned and brought to standard conditions.

Aircraft contents must be inventoried. It is important to understand what comprises the aircraft weight measurement. An accurate inventory is an important part of the weigh process. Additionally, ensure that flap positions, horizontal stabilizers and seat positions and other movable aircraft parts are set according to manufacturer recommendations.

SCALE PREPARATION

Charge the scales prior to weighing the aircraft. Verify the scale calibration. Allow the scales to acclimate to the temperature in the hangar before use.

Arrange the scales in the required configuration. Turn the scales on. Zero each scale, and verify a zero weight is displayed on the screen. Load the scales to conduct a load check. Specific information can be found in the scale user manual. Finally, check the aircraft manufacturer recommendations for any special weighing or leveling fixtures required to weigh the aircraft.

AIRCRAFT WEIGHING

LOAD WITH PLATFORMS

Release the aircraft brakes. Push or tow the aircraft onto the scales. Use chocks or tow bar to control the aircraft. Read and record all weights. Tow the aircraft off the scales. Verify and record that all scales return to zero. When possible, move the scales between positions. Push or tow the aircraft back on to the scales and weigh the aircraft a second time. Record the weights. Remove the aircraft from the scales. Verify and record that the scales return to zero.

LOAD TOP OF JACK CELLS

Attach the load cells to the top of jacks. Position the jacks under the jacking points. Raise the aircraft and level in accordance with the manufacturer recommendations. Read and record all weights. Lower the aircraft. Verify that all load cells return to zero. When possible, exchange load cells between positions. Jack and level the aircraft again. Record the weights. Lower the aircraft. Verify that the load cells return to zero.

Compare the weights obtained from the first and second weighings. Both weights should equal each other within a specified tolerance. The tolerance may vary depending application but a typical tolerance is 0.25%.

If the deviation between the two weight readings is greater than the standard tolerance, repeat the weighing, taking care to move the scales to different positions from the previous weighing. Check to see if an individual scale is not weighing correctly (displaying too much or too little weight). Weighing discrepancies will move with the cell. When weigh measurements are obtained that are within the specified tolerance, average the two closest readings.



ATTENTION: While not a requirement to conduct two or more weighings when rotating scale positions, it may advantageous to do so if discrepancies exist in the weigh results. Intercomp recommends this practice, regardless of type or manufacturer of the scale.

WEIGHING COMPLETE

When the weighing is completed, calculate scale factor corrections to compensate for latitude and altitude differences. Intercomp scale systems will calculate these differences when set-up correctly prior to weighing the aircraft.

Calculate Mean Aerodynamic Chord (MAC) if required by Center of Gravity (CG) specifications.

Compare the scale readings with the calculated values. There should be little or no deviation between the two values. Possible discrepancies could be related to weighing errors (residual fuel, residual water, equipment, etc.) or operator errors (recording readings, calculation errors, charting errors, scale calibration).

AC60-LP-IS PLATFORM SCALE



Operation/Calibration Manual

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NOTIFICATIONS

SAFETY SUMMARY

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WARNING: Due to danger of introducing hazards, do not substitute parts or perform any unauthorized modifications of the scale.

NOTICE

All rights reserved. The information contained in this publication is derived in part from proprietary and patent data of the Intercomp Corporation. This information has been prepared for the express purpose of assisting operating and maintenance personnel in the efficient use of the instrument described herein. Publication of this information does not convey any rights to use or reproduce it or to use it for any purpose other than in connection with the installation, operation, and maintenance of the equipment described herein. While every precaution has been taken in the preparation of this manual, Intercomp Corporation assumes no responsibility for damages resulting from the use of the information contained herein. All instructions and diagrams have been checked for accuracy and ease of application; however, success and safety in working with tools depend largely upon the individual accuracy, skill, and caution. For this reason, Intercomp Company is not able to guarantee the result of any procedure contained herein. Nor can they assume responsibility for any damage to property or injury to persons occasioned from the procedures. Persons engaging the procedures do so entirely at their own risk.

WARRANTY

INTERCOMP Company (hereafter referred to as "the company") warrants the products which this document accompanies to be free of defects in materials and workmanship, and to operate according to design specifications for a period of one (1) year after receipt by the original purchaser. After authorized return to the company at the purchaser's expense, the company shall evaluate any returned equipment under warranty claim and shall make such repairs or replacements as may be judged necessary, in as expeditious a manner as possible.

IN THE EVENT that the company determines the claim to be made as a result of improper use, abuse, modification, shipping damage, or other factors beyond the reasonable control of the company, the company will advise the purchaser of the estimated repair costs. The company makes no warranty other than that contained in this statement. No agent other than an executive officer of Intercomp Company is

COMPLIANCE WITH FCC RULES

Please note that this equipment generates, uses, and can radiate radio frequency energy. If this equipment is not installed and operated in accordance with the AC60-LP-IS Platform Scale User Manual, interference to radio communications may result. This unit has been tested and has been found to comply with the limits for a Class A computing device pursuant to subpart J of part 15 of FCC Rules. These rules are designed to provide reasonable protection against interference when equipment is operated in a commercial environment. However, if this unit is operated in a residential area, it is likely to cause interference and under these circumstances the user will be required to take whatever measures are necessary to eliminate the interference at their own expense.

INTRODUCTION

This manual contains specifications, operating instructions and calibration procedures for the Intercomp Model AC60-LP-IS Platform Scale. The AC60-LP-IS system provides the capability to weigh light to medium capacity aircraft.

FEATURES

- Independent weight readout on each scale
- Accuracy of $\pm 0.1\%$ of applied load or ± 5 lbs
- lb or kg selectable readout
- Capability to apply altitude and latitude correction values automatically
- Auto Zero Tracking automatically corrects zero-weight display shifts
- 5½ digit LCD readout with automatic backlighting
- RFI/EMI protection
- Automatic shut-off to conserve battery life
- Low battery detection with automatic shutoff
- Built-in self-diagnostics to check operation of Load cells, Memory, Display, AD converter and Power Supply
- Weigh pads manufactured from high strength aluminum alloys
- Wireless communications
- Intrinsically Safe for Class I, Division 1, Groups C and D Hazardous (Classified) Locations

OPTIONS

- Transport Cart for weigh scales, ramps and spacers

SPECIFICATIONS

CONTROLS

| CONTROL PANEL SWITCHES | | | |
|--|---------------|------------|------------|
| lbs / kg | ZERO | ON/OFF | MODE |
| ON-SCREEN INDICATORS | | | |
| lbs / kg | BATTERY LEVEL | SET POINTS | ERROR ICON |
| DISPLAY SCREEN | | | |
| 5 1/2 Digit, Liquid Crystal Display (LCD) with Automatic Back Lighting | | | |

ELECTRICAL

| FUNCTION | SPECIFICATION |
|-------------------------|---|
| Batteries | Duracell MN1500 (IEC-LR6/ANSI-15A/Size AA) Batteries |
| Optional External Power | 6 VDC through a protective interface |
| Battery Life | Radio OFF: 200 hours |
| | Radio ON: 150 hours |
| Auto Shut-Off | After 60 minutes without use. Shut-off time is adjustable |
| Filtering | 6 Pole, 10 Hertz Low Pass |
| Auto-Zero | Satisfies All HB-44 Requirements |

PERFORMANCE

| FUNCTION | SPECIFICATION |
|----------------------|---|
| Capacity | 60000 lb / 30000 kg by 5 lb / 2 kg |
| | 70000 lb / 35000 kg by 10 lb / 5 kg |
| Safe Overload | 60,000 lb Scale: 150% of capacity |
| | 70,000 lb Scale: 114% of capacity |
| Accuracy | 60,000 lb Scale: $\pm 0.1\%$ of Reading or ± 5 lbs, whichever is greater |
| | 70,000 lb Scale: $\pm 0.1\%$ of Reading or ± 10 lbs, whichever is greater |
| Speed | 2 seconds to typical reading (Static) |
| Calibration Interval | Twelve Months |
| ATEX Rating | II 2 G Ex ib IIB T3 Gb |

ENVIRONMENTAL

| FUNCTION | SPECIFICATION |
|----------------------|--|
| Humidity | 10 to 95% non-condensing |
| Temperature | Operating: -20 C to +40 C / -4 F to +104 F |
| | Storage: -40 C to +75 C / -40 F to +170 F |
| Degree of Protection | IP65 |

SPECIFICATIONS

PHYSICAL

| FUNCTION | SPECIFICATION |
|------------------|-----------------------------|
| Scale Dimensions | 77.5 cm X 78 cm X 5.7 cm |
| | 30.5 in x 30.7 in x 2.25 in |
| Scale Platform | 71 cm x 56 cm |
| | 28 in x 22 in |
| Weight | 51kg / 112 lb |

RADIO

| FUNCTION | SPECIFICATION |
|----------------------|--|
| Radio Frequency | ISM 2.4GHz, 802.15.4 DSSS* |
| License Requirements | None. Pre-approved US/FCC, CAN/IC, EUR/CE |
| Range | 60m /200 ft indoor, 90m / 300 ft line of sight |

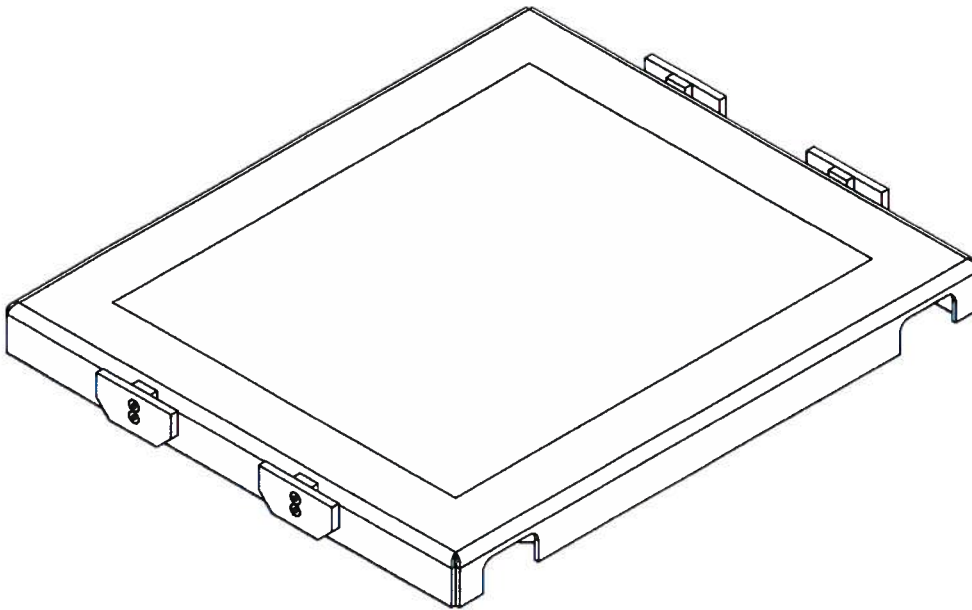
- * Radio Notes: Frequency: ISM 2.4GHz (2.400GHz - 2.483GHz), with 12 channels (CH 1 -12) within that range with each center frequency = 2405MHz + (CH * 5) MHz Power output 63mW (18dBm), 10mW (10dBm) for international variant. Antenna is internal surface mount with -1.5dbi gain, omni-directional.



WARNING: FCC Radio Frequency (RF) exposure requirements for mobile transmitting devices dictate that a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during device operation. To ensure compliance, operations at closer than this distance is not recommended. The antenna used for this transmitter must not be co-located with any other antenna or transmitter.

SPECIFICATIONS: AC60-LP-IS / AXLE SPACER PN 144009

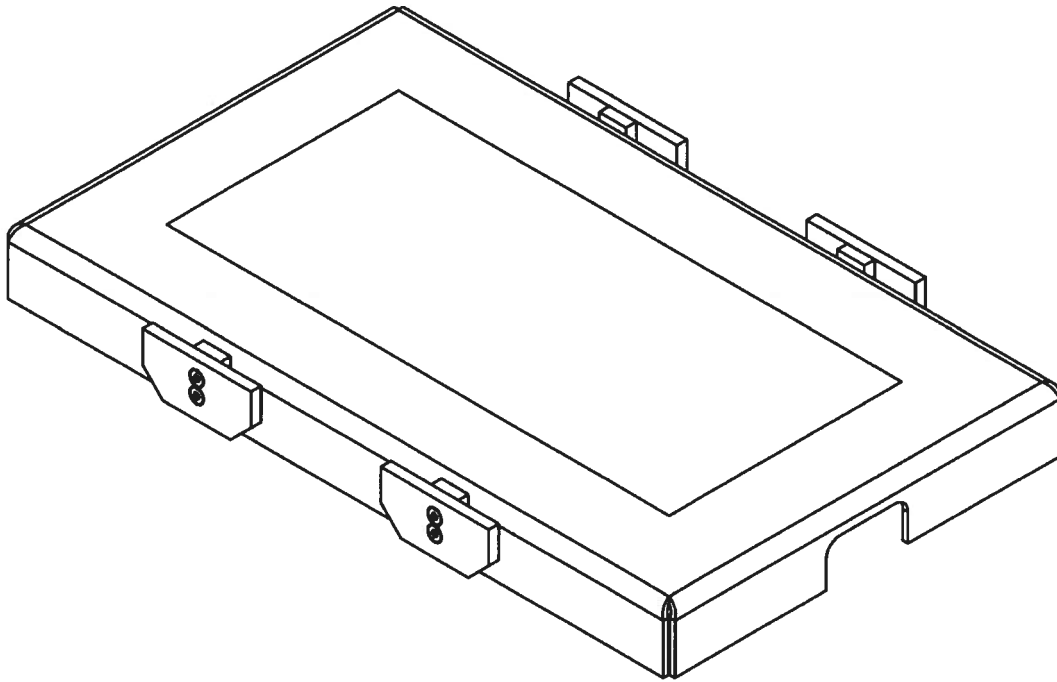
Weight: 23 lb (10.4 kg)
Dimensions: 30" X 28.5" X 2.25" (76.2 cm X 72.4 cm x 5.7 cm)



SPECIFICATIONS: AC60-LP-IS / AXLE SPACER B757

PN-144010

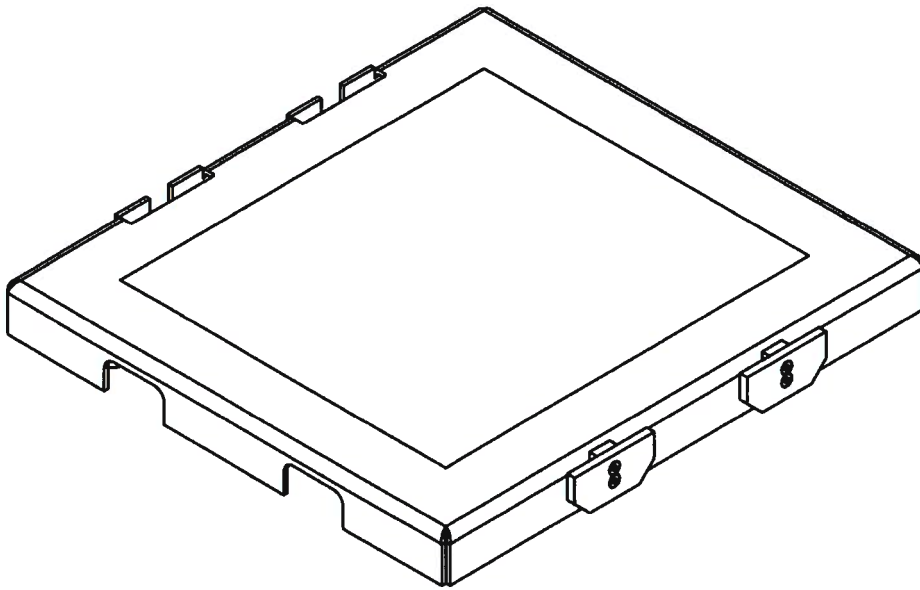
Weight: 13 lb (5.9 kg)
Dimensions: 16" X 24.5" X 2.25" (40.6 cm X 62.3 cm X 5.7 cm)



SPECIFICATIONS: AC60-LP-IS / AXLE SPACER A340

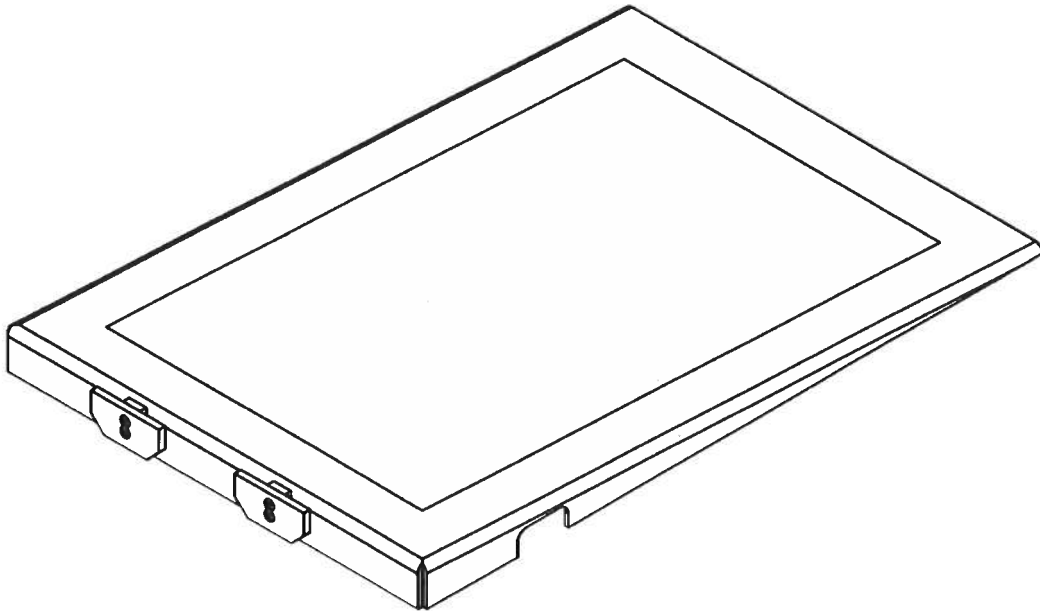
PN-144011

Weight: 18 lb (5.9 kg)
Dimensions: 23.25" X 24.5" X 2.25" (59 cm X 62.3 cm X 5.7 cm)



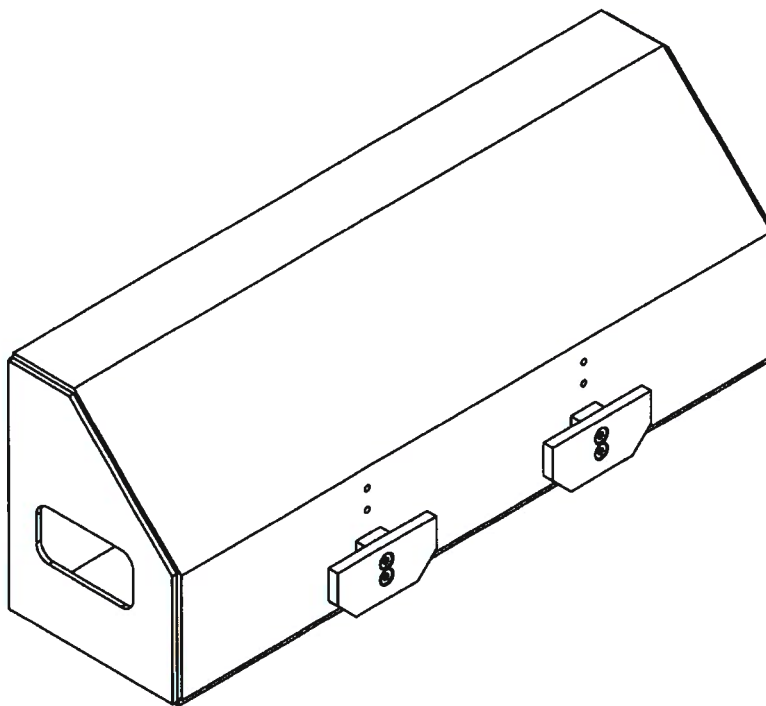
SPECIFICATIONS: AC60-LP-IS RAMP PN - 144012 ENTRY RAMP

Weight: 18 lb (8.2kg)
Dimensions: 37" X 24.5" (94 cm X 62.2 cm)



SPECIFICATIONS: AC60-LP-IS TIRE STOP PN-144013

Weight: 20 lb (9 kg)
Dimensions: 6.75" X 24.4" X 7.75" (17.1 cm X 62 cm X 19.7 cm)

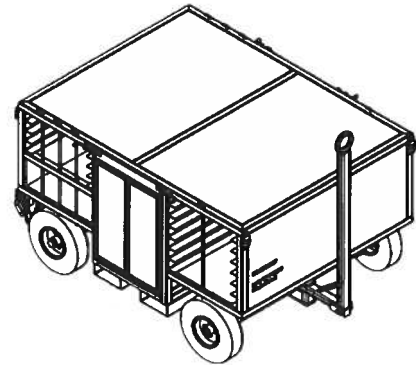
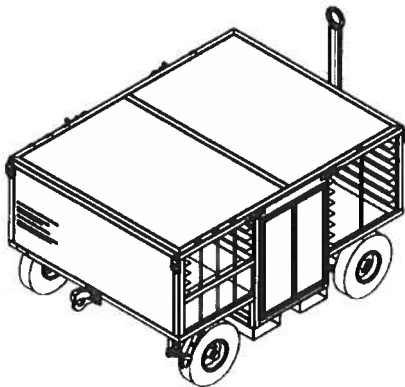


SPECIFICATIONS: AC60-LP-IS / TRANSPORT CART

12 pad - 145007

TRANSPORT CART

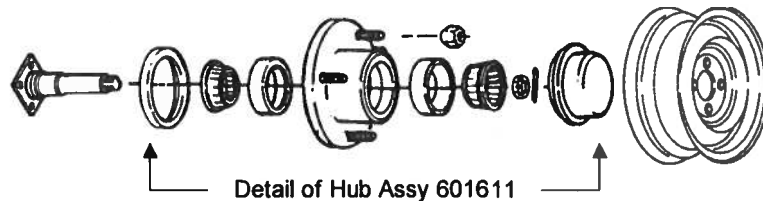
Weight: 1300 lb (589.7 kg)
Dimensions: 96.5" X 67.2" X 65.7 (245.1 cm X 170.7 cm X 166.9 cm)



REPACK WHEEL HUBS

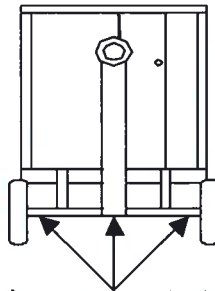
NOTE: Pack wheel hubs once every two years.

1. Jack up the cart and install safety stands or blocking.
2. Remove the dust caps.



3. Remove cotter pin.
 4. Remove castle nut and thrust washer.
 5. Remove outer bearing.
 6. Remove hub and inner bearing
 7. Remove inner grease seal and bearing.
 8. Clean grease from spindle, races, and bearings.
 9. Lubricate inner and outer bearings with wheel bearing grease.
 10. Replace inner bearing and press in new grease seal.
 11. Replace hub-bearing-seal assembly on spindle.
 12. Replace outer bearing and thrust washer.
 13. Install castle nut and tighten to hand tight.
 14. Advance nut to first available position to install a new 1/8" x 2" cotter pin.
- Note:** Always use a new cotter pin.
15. Replace dust cap.
 16. Lower the cart.

GREASE POINTS

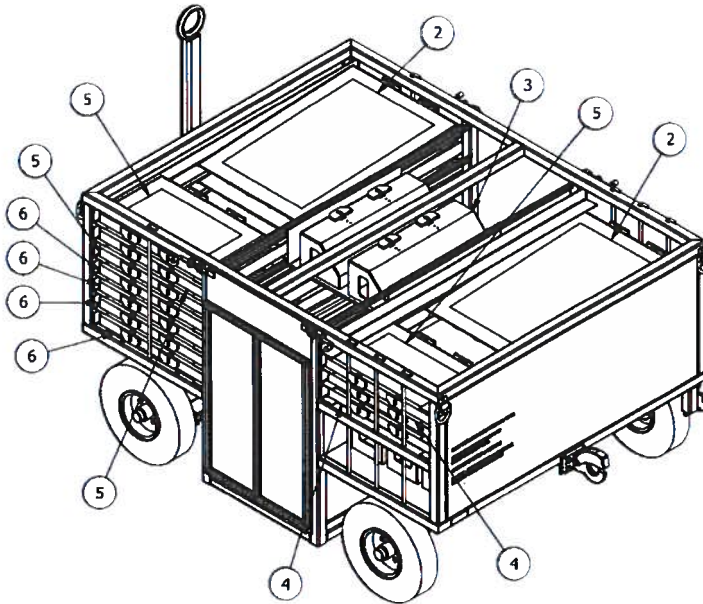


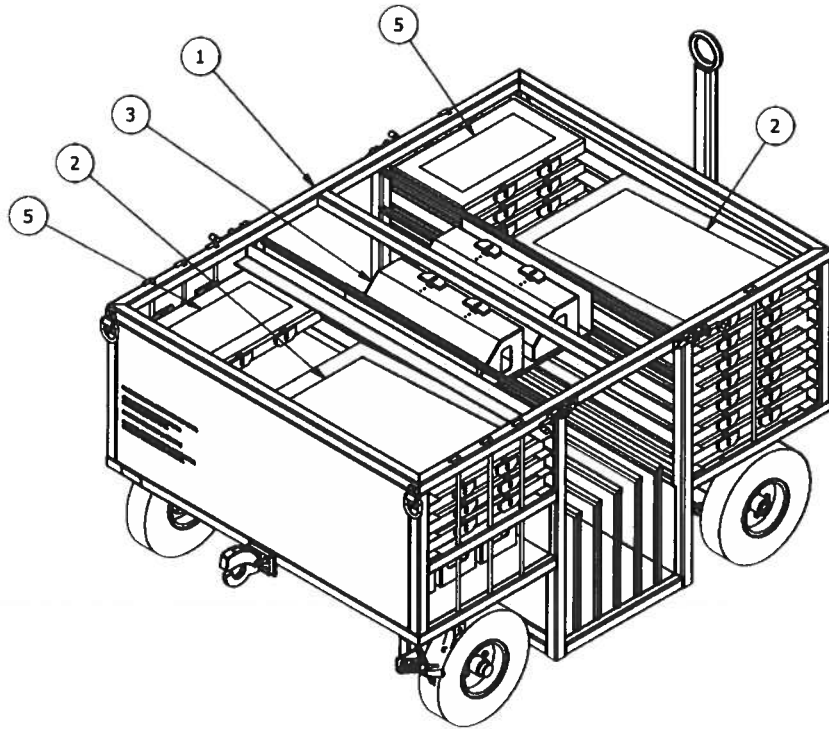
Steering Grease Points (3)
Lubricate Yearly

WHEEL REPLACEMENT

1. Jack up the cart and install safety stands or blocking.
2. Remove the four wheel mounting bolts.
3. Position the replacement wheel. (Intercomp part number 601634)
4. Install and tighten the mounting bolts.
5. Lower the cart.

LOADING





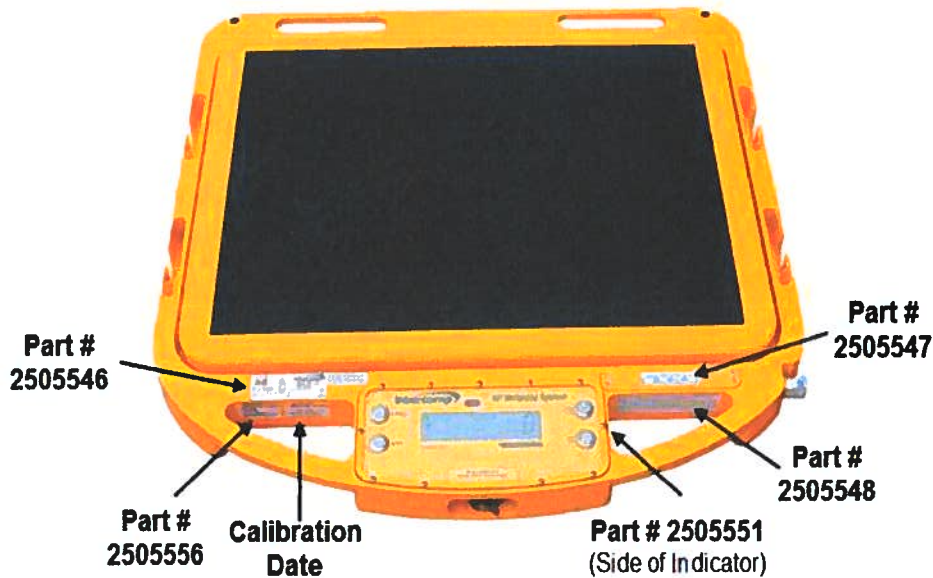
Legend

- 1. AC60LP Transport Cart
- 2. AC60-LP Ramp
- 3. AC60-LP Tire Stop
- 4. AC60-LP Spacer
- 5. AC60-LP Spacer B757
- 6. AC60-LP Spacer A340

AC60-LP-IS PRODUCT LABELING



WARNING: If any labels referenced below are missing or illegible, contact Intercomp for a replacement. Failure to maintain the product labeling could result in unsafe equipment operation or hazardous weighing conditions.



Label Part # 2505546 Contents

FM22UKEX0005X
FM15ATEX0044X
I.S. Class 1, Div 1, Groups C, D T3
Not to be used for direct sale to the public

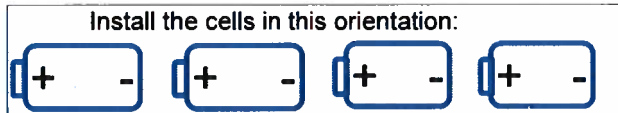
Label Part # 2505556 Contents

Intercomp 3839 County Road 116
Medina, MN 55340 USA
(763)476-2531
Part: XXXXXXXXXXXX
Model Description
Serial: XXXXXXXXXXXX

Label Part # 2505551 Contents

Contains FCC ID: OUR-XBEE/OUR-XBEEPRO
The enclosed device complies with Part 15 of the FCC Rules.
Operation is subject to the following two conditions:
1) this device may not cause harmful interference and
2) this device must accept any interference received,
including interference that may cause undesired operation.

Label Part # 2505547 Contents



Label Part # 2505548 Contents

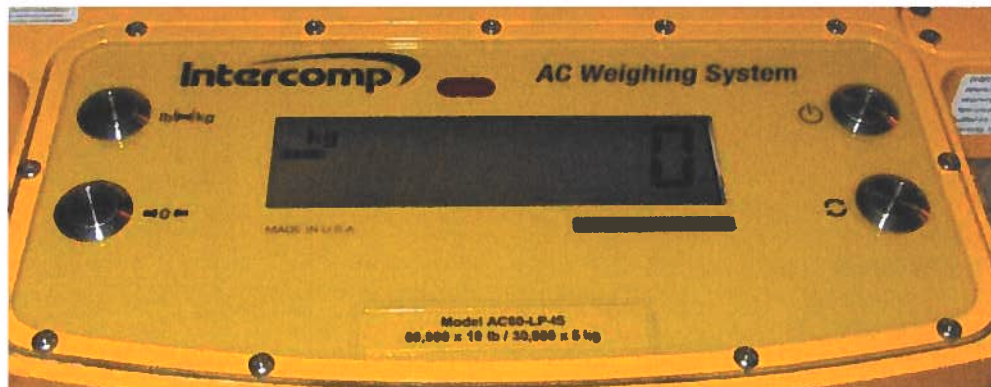
WARNING: Do not separate data / external power connector when energized. **WARNING:** Do not change batteries when an explosive atmosphere may be present. **WARNING:** Use Duracell MN1500 batteries.
WARNING: Do not mix old and new cells or cells from different manufacturers
WARNING: To prevent the risk of electrostatic sparking the display window should only be cleaned with a damp cloth. **WARNING:** This scale contains aluminum and is considered to constitute a potential risk of ignition by impact or friction. Care must be taken during installation and use to prevent impact or friction.
WARNING: The scale will not pass a 500 VRMS insulation test between the circuit and frame. This shall be taken into account during installation using external power for example by use of a bonding conductor to the frame ground.

SCALE OVERVIEW

The AC60-LP-IS Platform Scale is comprised of the active weighing platform and control electronics. The Control Panel houses the scale system electronics.



CONTROL PANEL



CONTROL PANEL SWITCHES

ON/OFF

Press the ON/OFF switch to turn the scale on or off. When power is first applied, the weighing system performs a self-test of the scale and the internal electronics. When the tests have been completed successfully, the system begins weighing. If a problem is detected, the screen displays an error message.

MODE

The MODE switch is used to cycle through the MODE menu when the scale is set in the Run mode. When the scale is set in the CAL mode, the MODE switch is used to cycle through the Calibration menu.

SCALE OVERVIEW

Control Panel (continued)

lb/kg

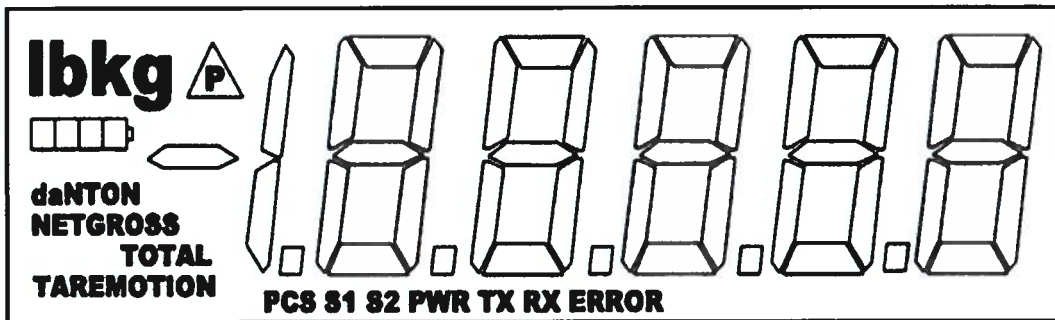
The lb/kg switch toggles the weighing system between the pound (English) and kilogram (SI metric) unit of measure. When the lb/kg switch is pressed, the system switches to the nearest comparable value in the selected unit of measure.

ZERO














The ZERO switch is used to reset the scale to display zero pounds or kilograms. If the ZERO switch is pressed with weight on the scale, the weight becomes the zero condition for the scale. The ZERO feature is useful to cancel the weight of weighing fixtures such as tail cones or wheel chocks. When the weight is removed from the scale, a negative weight is displayed until the system is re-zeroed. The AC60-LP-IS system employs a feature called Auto Zero Tracking (AZT). AZT corrects for slight zero shifts during normal operation. An example of a zero shift could be a buildup of dirt on the scales.

LCD DISPLAY





The AC60-LP-IS Scale control panel uses a Liquid Crystal Display (LCD) unit (shown below) providing one line of 5 1/2 digits. The screen displays the weight read from the scale active weighing surface. Information displayed includes indicators for lb and kg unit of measure and a segment bar indicating battery power level. The display has an automatic backlight for use in low-light conditions.
















ENGLISH - OPERATING PRACTICES

| | |
|---|---|
|  | WARNING: The aircraft scale must be operated by qualified designated persons, trainees under the direct supervision of designated persons, maintenance, and test personnel when in performance of their assigned duties. |
|  | WARNING: Do not exceed the rated load limit of the aircraft scale. |
|  | WARNING: Do not operate aircraft scale if damaged, malfunctioning, or missing parts. |
|  | WARNING: Do not remove or obscure warning labels. |
|  | WARNING: Do not operate the aircraft scale without having read and understood the operating manual. |
|  | WARNING: Do not make alterations or modifications to the aircraft scale. |
|  | WARNING: Do not change batteries when an explosive atmosphere may be present. |
|  | WARNING: Do not change the fuse when an explosive atmosphere may be present. |
|  | WARNING: Do not open the scale or perform maintenance when an explosive atmosphere may be present. |
|  | WARNING: Do not mix old and new batteries or batteries from different manufacturers. |
|  | WARNING: If the scale is powered from an external power supply it must be connected through a protective interface to maintain intrinsic safe protection. |
|  | WARNING: Do not separate data / external power connector when energized. |
|  | WARNING: Do not use the RS485 serial port. To access data remotely, use the radio connection. |




ENGLISH - SPECIFIC CONDITIONS OF USE

| | |
|---|---|
|  | WARNING: Only Duracell Type MN1500, Size: AA (LR6), 1.5 V (Nom) Alkaline-Manganese Dioxide Battery (Zn/MnO ₂). |
|  | WARNING: The scale contains aluminum and is considered to constitute a potential risk of ignition by impact or friction. Caution must be observed during installation and use to prevent impact or friction. |
|  | WARNING: The enclosure contains a window constructed from plastic. To prevent the risk of electrostatic sparking the plastic surface should only be cleaned with a damp cloth. |
|  | WARNING: The scale will not pass a 500 VRMS insulation test between the circuit and circuit frame. This shall be taken into account during installation for example by use of a bonding conductor to the barrier ground. |














NEDERLANDS - WERKWIJZEN BIJ GEBRUIK

| | |
|---|--|
|  | WAARSCHUWING: De vliegtuigweegschaal moet worden bediend door gekwalificeerde aangewezen personen, stagiaires onder direct toezicht van aangewezen personen, onderhouds- en testpersoneel tijdens de uitvoering van hun toegewezen taken. |
|  | WAARSCHUWING: Overschrijd het beoordeelde belastingslimiet van de vliegtuigweegschaal niet. |
|  | WAARSCHUWING: Bedien de vliegtuigweegschaal niet als deze beschadigd is, niet goed functioneert of onderdelen ontbreken. |
|  | WAARSCHUWING: Verwijder of verberg geen waarschuwingslabels. |
|  | WAARSCHUWING: Bedien de vliegtuigweegschaal niet zonder de gebruiksaanwijzing te hebben gelezen en begrepen. |
|  | WAARSCHUWING: Breng geen wijzigingen aan of voer geen aanpassingen uit aan de vliegtuigweegschaal. |
|  | WAARSCHUWING: Vervang de batterijen niet als er zich een explosieve atmosfeer kan bevinden. |
|  | WAARSCHUWING: Vervang de zekering niet als er zich een explosieve atmosfeer kan bevinden. |
|  | WAARSCHUWING: Open de weegschaal niet en voer geen onderhoud uit als er zich een explosieve atmosfeer kan bevinden. |
|  | WAARSCHUWING: Meng geen oude en nieuwe batterijen of batterijen van verschillende fabrikanten. |
|  | WAARSCHUWING: Als de weegschaal van een externe voeding wordt voorzien, moet deze worden aangesloten via een beschermende interface om intrinsiek veilige bescherming te behouden. |
|  | WAARSCHUWING: Koppel de data-/externe voedingsconnector niet los wanneer deze is ingeschakeld. |
|  | WAARSCHUWING: Gebruik de RS485 seriële poort niet. Gebruik de radiokoppeling om op afstand toegang tot de gegevens te verkrijgen. |





NEDERLANDS - SPECIFIEKE GEBRUIKSVORWAARDEN

| | |
|---|---|
|  | WAARSCHUWING: Alleen Duracell Type MN1500, Formaat: AA (LR6), 1,5 V (Nom) Alkaline-Mangaan Dioxide Batterij (Zn/MnO ₂). |
|  | WAARSCHUWING: De weegschaal bevat aluminium en wordt beschouwd als een potentieel risico op ontsteking door impact of wrijving. Voorzichtigheid moet worden betracht tijdens de installatie en het gebruik om impact of wrijving te voorkomen. |
|  | WAARSCHUWING: De behuizing bevat een venster van plastic. Om het risico van elektrostatische vonken te voorkomen, dient het plastic oppervlak alleen met een vochtige doek te worden gereinigd. |
|  | WAARSCHUWING: De weegschaal zal geen isolatietest van 500 VRMS doorstaan tussen het circuit en het circuitframe. Hiermee moet rekening worden gehouden tijdens de installatie, bijvoorbeeld door gebruik te maken van een verbindingsgeleider naar de afschermdende aarde. |














FRANÇAIS - PRATIQUES D'UTILISATION

| | |
|---|--|
|  | AVERTISSEMENT: La balance d'aéronef doit être exploitée par des personnes désignées qualifiées, des stagiaires sous la supervision directe des personnes désignées, du personnel de maintenance et d'essai lors de l'exécution de leurs tâches assignées. |
|  | AVERTISSEMENT: Ne pas dépasser la limite de charge nominale de la balance d'aéronef. |
|  | AVERTISSEMENT: Ne pas utiliser la balance d'aéronef si elle est endommagée, présente un dysfonctionnement ou si des pièces sont manquantes. |
|  | AVERTISSEMENT: Ne pas retirer ou masquer les étiquettes d'avertissement. |
|  | AVERTISSEMENT: Ne pas faire fonctionner la balance d'aéronef sans avoir lu et compris le manuel d'utilisation. |
|  | AVERTISSEMENT: Ne pas apporter de modifications ou de modifications à la balance d'aéronef. |
|  | AVERTISSEMENT: Ne pas remplacer les piles en présence d'une atmosphère explosive. |
|  | AVERTISSEMENT: Ne pas remplacer le fusible en présence d'une atmosphère explosive. |
|  | AVERTISSEMENT: Ne pas ouvrir la balance ni effectuer de maintenance en présence d'une atmosphère explosive. |
|  | AVERTISSEMENT: Ne pas mélanger des piles anciennes et neuves ou des piles de fabricants différents. |
|  | AVERTISSEMENT: Si la balance est alimentée par une source d'alimentation externe, elle doit être connectée par le biais d'une interface de protection pour maintenir la protection intrinsèque en toute sécurité. |
|  | AVERTISSEMENT: Ne pas débrancher le connecteur de données / alimentation externe lorsque l'appareil est sous tension. |
|  | AVERTISSEMENT: Ne pas utiliser le port série RS485. Pour accéder aux données à distance, utilisez la connexion radio. |





FRANÇAIS - CONDITIONS D'UTILISATION SPÉCIFIQUES

| | |
|---|---|
|  | AVERTISSEMENT: Utiliser uniquement des piles Duracell de type MN1500, Taille : AA (LR6), 1,5 V (Nom) Alcaline-Dioxyde de manganèse (Zn/MnO ₂). |
|  | AVERTISSEMENT: La balance contient de l'aluminium et est considérée comme présentant un risque potentiel d'inflammation au contact d'un choc ou de frottements. Il convient de faire preuve de prudence lors de l'installation et de l'utilisation afin de prévenir tout choc ou frottement. |
|  | AVERTISSEMENT: L'enceinte contient une fenêtre en plastique. Pour éviter tout risque d'étincelle électrostatique, la surface en plastique ne doit être nettoyée qu'avec un chiffon humide. |
|  | AVERTISSEMENT: La balance ne réussira pas un test d'isolation de 500 VRMS entre le circuit et le châssis du circuit. Cela doit être pris en compte lors de l'installation, par exemple en utilisant un conducteur de liaison à la terre de la barrière. |














DEUTSCHLAND - BETRIEBSVERHALTEN

| | |
|---|---|
|  | WARNUNG: Die Flugzeugwaage darf nur von qualifizierten beauftragten Personen, Auszubildenden unter direkter Aufsicht von beauftragten Personen sowie Wartungs- und Prüfpersonal während der Ausführung ihrer zugewiesenen Aufgaben betrieben werden. |
|  | WARNUNG: Überschreiten Sie nicht die angegebene Lastgrenze der Flugzeugwaage. |
|  | WARNUNG: Betreiben Sie die Flugzeugwaage nicht, wenn sie beschädigt ist, fehlerhaft funktioniert oder Teile fehlen. |
|  | WARNUNG: Entfernen oder verdecken Sie keine Warnschilder. |
|  | WARNUNG: Betreiben Sie die Flugzeugwaage nicht, ohne die Bedienungsanleitung gelesen und verstanden zu haben. |
|  | WARNUNG: Nehmen Sie keine Änderungen oder Modifikationen an der Flugzeugwaage vor. |
|  | WARNUNG: Wechseln Sie die Batterien nicht aus, wenn sie sich in einer explosionsgefährdeten Atmosphäre befinden könnten. |
|  | WARNUNG: Wechseln Sie die Sicherung nicht aus, wenn sie sich in einer explosionsgefährdeten Atmosphäre befinden könnten. |
|  | WARNUNG: Öffnen Sie die Waage nicht und führen Sie keine Wartungsarbeiten durch, wenn sie sich in einer explosionsgefährdeten Atmosphäre befinden könnten. |
|  | WARNUNG: Mischen Sie keine alten und neuen Batterien oder Batterien verschiedener Hersteller. |
|  | WARNUNG: Wenn die Waage von einer externen Stromquelle gespeist wird, muss sie über einen Trenntrafo angeschlossen werden, um den Explosionsschutz aufrechtzuerhalten. |
|  | WARNUNG: Trennen Sie den externen Stromanschluss oder die Datenverbindung nicht, wenn er eingeschaltet ist. |
|  | WARNUNG: Verwenden Sie den RS485-seriellen Anschluss nicht. Verwenden Sie für den Remote-Zugriff die Funkverbindung. |





DEUTSCHLAND - SPEZIFISCHE NUTZUNGSBEDINGUNGEN

| | |
|---|---|
|  | WARNUNG: Verwenden Sie nur Duracell Typ MN1500, Größe: AA (LR6), 1,5 V (Nennwert) Alkaline-Mangandioxid-Batterie (Zn/MnO ₂). |
|  | WARNUNG: Die Waage enthält Aluminium und gilt als potenzielles Risiko für Entzündung durch Aufprall oder Reibung. Bei der Installation und Verwendung ist Vorsicht geboten, um Aufprall oder Reibung zu vermeiden. |
|  | WARNUNG: Das Gehäuse enthält ein Fenster aus Kunststoff. Um das Risiko elektrostatischer Funkenbildung zu vermeiden, sollte die Kunststoffoberfläche nur mit einem feuchten Tuch gereinigt werden. |
|  | WARNUNG: Die Waage wird einen Isolationstest mit 500 VRMS zwischen Schaltung und Schaltungsrahmen nicht bestehen. Dies sollte bei der Installation berücksichtigt werden, zum Beispiel durch Verwendung eines Erdungskabels. |














ΕΛΛΗΝΙΚΑ - ΛΕΙΤΟΥΡΓΙΚΕΣ ΠΡΑΚΤΙΚΕΣ

| | |
|---|---|
|  | ΠΡΟΕΙΔΟΠΟΙΗΣΗ: Η κλίμακα του αεροσκάφους πρέπει να λειτουργείται από εξειδικευμένα εξουσιοδοτημένα άτομα, εκπαιδευμένους υπό την άμεση επίβλεψη εξουσιοδοτημένων ατόμων, τεχνικό προσωπικό συντήρησης και ελεγκτικού εργαστηρίου κατά την εκτέλεση των εντεταλμένων καθηκόντων τους. |
|  | ΠΡΟΕΙΔΟΠΟΙΗΣΗ: Μην υπερβαίνετε το επιτρεπόμενο όριο φόρτου της κλίμακας του αεροσκάφους. |
|  | ΠΡΟΕΙΔΟΠΟΙΗΣΗ: Μην λειτουργείτε την κλίμακα του αεροσκάφους εάν είναι φθαρμένη, λειτουργεί με δυσλειτουργίες ή έχει απουσιάζουσες εξαρτήσεις. |
|  | ΠΡΟΕΙΔΟΠΟΙΗΣΗ: Μην αφαιρείτε ή επικαλύπτετε τις ετικέτες προειδοποίησης. |
|  | ΠΡΟΕΙΔΟΠΟΙΗΣΗ: Μην λειτουργείτε την κλίμακα του αεροσκάφους χωρίς να έχετε διαβάσει και κατανοήσει το εγχειρίδιο λειτουργίας. |
|  | ΠΡΟΕΙΔΟΠΟΙΗΣΗ: Μην πραγματοποιείτε τροποποιήσεις ή τροποποιήσεις στην κλίμακα του αεροσκάφους. |
|  | ΠΡΟΕΙΔΟΠΟΙΗΣΗ: Μην αλλάζετε τις μπαταρίες όταν υπάρχει εκρηκτικό περιβάλλον. |
|  | ΠΡΟΕΙΔΟΠΟΙΗΣΗ: Μην αλλάζετε το ασφαλιστήριο όταν υπάρχει εκρηκτικό περιβάλλον. |
|  | ΠΡΟΕΙΔΟΠΟΙΗΣΗ: Μην ανοίγετε την κλίμακα ή πραγματοποιείτε συντήρηση όταν υπάρχει εκρηκτικό περιβάλλον. |
|  | ΠΡΟΕΙΔΟΠΟΙΗΣΗ: Μην αναμιγνύετε παλιές και νέες μπαταρίες ή μπαταρίες από διάφορους κατασκευαστές. |
|  | ΠΡΟΕΙΔΟΠΟΙΗΣΗ: Εάν η κλίμακα λειτουργεί με τροφοδοσία από εξωτερική πηγή πρέπει να συνδέεται μέσω προστατευτικής διαπαφής για τη διατήρηση της επωνυμίας ασφαλείας. |
|  | ΠΡΟΕΙΔΟΠΟΙΗΣΗ: Μην αποσυνδέετε τον συνδετήρα δεδομένων / εξωτερικής τροφοδοσίας όταν είναι ενεργοποιημένος. |
|  | ΠΡΟΕΙΔΟΠΟΙΗΣΗ: ΜΗΝ ΧΡΗΣΙΜΟΠΟΙΕΙΤΕ ΤΗΝ ΣΕΙΡΙΑΚΗ ΘΥΡΑ RS485. ΓΙΑ ΠΡΟΣΒΑΣΗ ΣΤΑ ΔΕΔΟΜΕΝΑ ΑΠΟ ΑΠΟΣΤΑΣΗ, ΧΡΗΣΙΜΟΠΟΙΗΣΤΕ ΤΗ ΡΑΔΙΟΣΥΝΔΕΣΗ. |





ΕΛΛΗΝΙΚΑ - ΣΥΓΚΕΚΡΙΜΕΝΕΣ ΣΥΝΟΗΚΕΣ ΧΡΗΣΗΣ

| | |
|---|---|
|  | ΠΡΟΕΙΔΟΠΟΙΗΣΗ: Μόνο Μπαταρίες Duracell Τύπου MN1500, Μέγεθος: AA (LR6), 1,5 V (Ενδιάμεση Τάση) Αλκαλικό-Μαγγανικό Διοξείδιο Ψευδαργύρου (Zn/MnO ₂). |
|  | ΠΡΟΕΙΔΟΠΟΙΗΣΗ: Η κλίμακα περιέχει αλουμίνιο και θεωρείται ότι αποτελεί δυνητικό κίνδυνο ανάφλεξης από πτώση ή τριβή. Πρέπει να τηρηθεί προσοχή κατά την εγκατάσταση και τη χρήση προκειμένου να αποφευχθούν πτώση ή τριβές. |
|  | ΠΡΟΕΙΔΟΠΟΙΗΣΗ: Η θήκη περιέχει παράθυρο κατασκευασμένο από πλαστικό. Για να αποφευχθεί ο κίνδυνος ηλεκτροστατικής ανάφλεξης, η επιφάνεια από πλαστικό πρέπει να καθαρίζεται μόνο με υγρό πανί. |
|  | ΠΡΟΕΙΔΟΠΟΙΗΣΗ: Η κλίμακα δεν θα περάσει δοκιμή μόνωσης 500 VRMS μεταξύ του κυκλώματος και του πλαισίου κυκλώματος. Αυτό πρέπει να ληφθεί υπόψη κατά την εγκατάσταση, για παράδειγμα μέσω χρήσης αγωγού σύνδεσης με τη γείωση τοιχώματος. |














ITALIANO - PRASSI OPERATIVE

| | |
|---|--|
|  | ATTENZIONE: La bilancia per aeromobili deve essere utilizzata da persone designate qualificate, apprendisti sotto la supervisione diretta delle persone designate, personale di manutenzione e collaudo quando svolgono i loro compiti assegnati. |
|  | ATTENZIONE: Non superare il limite di carico nominale della bilancia per aeromobili. |
|  | ATTENZIONE: Non utilizzare la bilancia per aeromobili se è danneggiata, malfunzionante o mancano parti. |
|  | ATTENZIONE: Non rimuovere o coprire le etichette di avvertimento. |
|  | ATTENZIONE: Non utilizzare la bilancia per aeromobili senza aver letto e compreso il manuale d'uso. |
|  | ATTENZIONE: Non apportare modifiche o alterazioni alla bilancia per aeromobili. |
|  | ATTENZIONE: Non sostituire le batterie quando può essere presente un'atmosfera esplosiva. |
|  | ATTENZIONE: Non sostituire il fusibile quando può essere presente un'atmosfera esplosiva. |
|  | ATTENZIONE: Non aprire la bilancia o effettuare manutenzione quando può essere presente un'atmosfera esplosiva. |
|  | ATTENZIONE: Non mescolare batterie vecchie e nuove o batterie di diversi produttori. |
|  | ATTENZIONE: Se la bilancia è alimentata da una fonte di alimentazione esterna, deve essere collegata tramite un'interfaccia protettiva per mantenere la protezione intrinseca. |
|  | ATTENZIONE: Non separare il connettore dati/alimentazione esterna quando è alimentato. |
|  | ATTENZIONE: Non utilizzare la porta seriale RS485. Per accedere ai dati a distanza, utilizzare la connessione radio. |





ITALIANO - CONDIZIONI SPECIFICHE D'USO

| | |
|---|---|
|  | ATTENZIONE: Utilizzare solo batterie Duracell Tipo MN1500, Dimensioni: AA (LR6), 1,5 V (Nom) Batteria alcalina al manganese-diossido (Zn/MnO ₂). |
|  | ATTENZIONE: La bilancia contiene alluminio ed è considerata un potenziale rischio di accensione per impatto o attrito. Durante l'installazione e l'uso, è necessario fare attenzione per prevenire impatti o attriti. |
|  | ATTENZIONE: L'involucro contiene una finestra realizzata in plastica. Per prevenire il rischio di scintille elettrostatiche, la superficie in plastica deve essere pulita solo con un panno umido. |
|  | ATTENZIONE: La bilancia non supererà un test di isolamento di 500 VRMS tra il circuito e la struttura del circuito. Questo deve essere preso in considerazione durante l'installazione, ad esempio mediante l'uso di un conduttore di messa a terra per la barriera. |














POLSKI - PRAKTYKI OPERACYJNE

| | |
|---|--|
|  | OSTRZEŻENIE: Wagę do samolotów muszą obsługiwać wykwalifikowane osoby wyznaczone, praktykanci pod bezpośrednim nadzorem osób wyznaczonych, personel techniczny oraz osoby przeprowadzające testy podczas wykonywania swoich obowiązków. |
|  | OSTRZEŻENIE: Nie przekraczaj dopuszczalnego obciążenia wagi samolotu. |
|  | OSTRZEŻENIE: Nie używaj wagi samolotu, jeśli jest uszkodzona, nie działa prawidłowo lub brakuje jej części. |
|  | OSTRZEŻENIE: Nie usuwaj ani nie zasłaniaj etykiet ostrzegawczych. |
|  | OSTRZEŻENIE: Nie używaj wagi samolotu bez wcześniejszego zapoznania się z instrukcją obsługi i jej zrozumienia. |
|  | OSTRZEŻENIE: Nie wprowadzaj zmian ani modyfikacji w wadze samolotu. |
|  | OSTRZEŻENIE: Nie wymieniaj baterii w miejscu, gdzie może wystąpić atmosfera wybuchowa. |
|  | OSTRZEŻENIE: Nie wymieniaj bezpiecznika w miejscu, gdzie może wystąpić atmosfera wybuchowa. |
|  | OSTRZEŻENIE: Nie otwieraj wagi ani nie przeprowadzaj konserwacji w miejscu, gdzie może wystąpić atmosfera wybuchowa. |
|  | OSTRZEŻENIE: Nie łącz starych i nowych baterii ani baterii od różnych producentów. |
|  | OSTRZEŻENIE: Jeśli waga jest zasilana z zewnętrznego źródła energii, musi być podłączona przez interfejs ochronny, aby zachować ochronę wewnętrzną. |
|  | OSTRZEŻENIE: Nie rozłączaj złącza danych / zewnętrznego zasilania pod napięciem. |
|  | OSTRZEŻENIE: Nie używaj portu szeregowego RS485. Aby zdalnie uzyskać dostęp do danych, używaj połączenia radiowego. |





POLSKI - SPECYFICZNE WARUNKI UŻYTKOWANIA

| | |
|---|--|
|  | OSTRZEŻENIE: Tylko bateria Duracell typu MN1500, rozmiar: AA (LR6), 1,5 V (Nom) alkaliczno-manganowa (Zn/MnO ₂). |
|  | OSTRZEŻENIE: Waga zawiera aluminium i jest uważana za potencjalne źródło ryzyka zapłonu przez uderzenie lub tarcie. Należy zachować ostrożność podczas instalacji i użytkowania, aby zapobiec uderzeniom lub tarcie. |
|  | OSTRZEŻENIE: Obudowa zawiera okno wykonane z tworzywa sztucznego. Aby zapobiec ryzyku iskrzenia elektrostatycznego, powierzchnię z tworzywa sztucznego należy czyścić tylko wilgotną szmatką. |
|  | OSTRZEŻENIE: Waga nie przejdzie testu izolacji o napięciu 500 VRMS pomiędzy obwodem a ramą obwodu. Należy wziąć to pod uwagę podczas instalacji, na przykład poprzez użycie przewodu łączącego z uziemieniem bariery. |














PORTUGUÊS - PRÁTICAS OPERACIONAIS

| | |
|---|--|
|  | AVISO: A balança de aeronaves deve ser operada por pessoas qualificadas e designadas, estagiários sob supervisão direta de pessoas designadas, pessoal de manutenção e teste quando em desempenho de suas funções atribuídas. |
|  | AVISO: Não exceda o limite de carga nominal da balança de aeronaves. |
|  | AVISO: Não opere a balança de aeronaves se estiver danificada, com mau funcionamento ou faltando peças. |
|  | AVISO: Não remova ou obscureça etiquetas de aviso. |
|  | AVISO: Não opere a balança de aeronaves sem ter lido e compreendido o manual de operação. |
|  | AVISO: Não faça alterações ou modificações na balança de aeronaves. |
|  | AVISO: Não troque as baterias quando houver uma atmosfera explosiva. |
|  | AVISO: Não troque o fusível quando houver uma atmosfera explosiva. |
|  | AVISO: Não abra a balança ou realize manutenção quando uma atmosfera explosiva puder estar presente. |
|  | AVISO: Não misture baterias antigas e novas ou baterias de diferentes fabricantes. |
|  | AVISO: Se a balança for alimentada por uma fonte de energia externa, ela deve ser conectada através de uma interface protetora para manter a proteção intrinsecamente segura. |
|  | AVISO: Não separe o conector de dados / energia externa quando estiver energizado. |
|  | AVISO: Não use a porta serial RS485. Para acessar os dados remotamente, use a conexão via rádio. |





PORTUGUÊS - CONDIÇÕES ESPECÍFICAS DE USO

| | |
|---|--|
|  | AVISO: Somente bateria Duracell Tipo MN1500, Tamanho: AA (LR6), 1,5 V (Nom) Alcalina-Manganês Dióxido (Zn/MnO ₂). |
|  | AVISO: A balança contém alumínio e é considerada um risco potencial de ignição por impacto ou atrito. Cuidado deve ser observado durante a instalação e uso para prevenir impacto ou atrito. |
|  | AVISO: A caixa contém uma janela feita de plástico. Para prevenir o risco de faíscas eletrostáticas, a superfície de plástico deve ser limpa apenas com um pano úmido. |
|  | AVISO: A balança não passará em um teste de isolamento de 500 VRMS entre o circuito e a estrutura do circuito. Isso deve ser levado em consideração durante a instalação, por exemplo, pelo uso de um condutor de ligação ao terra da barreira. |














ROMÂNĂ - PRACTICI DE OPERARE

| | |
|---|--|
|  | ATENȚIE: Cântarul pentru aeronave trebuie să fie operat de persoane desemnate și calificate, ucenici sub supravegherea directă a persoanelor desemnate, personal de întreținere și de testare atunci când își exercită sarcinile atribuite. |
|  | ATENȚIE: Nu depășiți limita de încărcare nominală a cântarului pentru aeronave. |
|  | ATENȚIE: Nu utilizați cântarul pentru aeronave dacă este deteriorat, nu funcționează corect sau îi lipsesc piese. |
|  | ATENȚIE: Nu îndepărtați sau nu ascundeți etichetele de avertizare. |
|  | ATENȚIE: Nu operați cântarul pentru aeronave fără a fi citit și înțeles manualul de operare. |
|  | ATENȚIE: Nu faceți alterări sau modificări la cântarul pentru aeronave. |
|  | ATENȚIE: Nu schimbați bateriile când există o atmosferă explozivă. |
|  | ATENȚIE: Nu schimbați siguranța când există o atmosferă explozivă. |
|  | ATENȚIE: Nu deschideți cântarul sau nu efectuați întreținere când este prezentă o atmosferă explozivă. |
|  | ATENȚIE: Nu amestecați baterii vechi cu baterii noi sau baterii de la producători diferiți. |
|  | ATENȚIE: Dacă cântarul este alimentat de la o sursă de alimentare externă, trebuie să fie conectat printr-o interfață protectoare pentru a menține protecția intrinsecă. |
|  | ATENȚIE: Nu deconectați conectorul de date / alimentare externă atunci când este sub tensiune. |
|  | ATENȚIE: Nu utilizați portul serial RS485. Pentru a accesa datele la distanță, utilizați conexiunea radio. |





ROMÂNĂ - CONDIȚII SPECIFICE DE UTILIZARE

| | |
|---|--|
|  | ATENȚIE: Doar bateria Duracell Tip MN1500, Dimensiune: AA (LR6), 1.5 V (Nom) Alcalină-Mangan Dioxid (Zn/MnO ₂). |
|  | ATENȚIE: Cântarul conține aluminiu și este considerat a prezenta un risc potențial de aprindere prin impact sau frecare. Trebuie să se manifeste precauție în timpul instalării și utilizării pentru a preveni impactul sau frecarea. |
|  | ATENȚIE: Închiderea conține o fereastră construită din plastic. Pentru a preveni riscul de scânteiere electrostatică, suprafața din plastic ar trebui să fie curățată doar cu o cârpă umedă. |
|  | ATENȚIE: Cântarul nu va trece un test de izolație de 500 VRMS între circuit și cadru de circuit. Acest aspect trebuie luat în considerare în timpul instalării, de exemplu prin utilizarea unui conductor de legare la pământul barierei. |

ESPAÑOL - PRÁCTICAS DE OPERACIÓN

| | |
|---|---|
|  | ADVERTENCIA: La báscula de la aeronave debe ser operada por personas designadas y calificadas, aprendices bajo la supervisión directa de personas designadas, personal de mantenimiento y prueba cuando estén realizando sus tareas asignadas. |
|  | ADVERTENCIA: No exceda el límite de carga nominal de la báscula de la aeronave. |
|  | ADVERTENCIA: No opere la báscula de la aeronave si está dañada, tiene un mal funcionamiento o faltan piezas. |
|  | ADVERTENCIA: No retire ni oculte las etiquetas de advertencia. |
|  | ADVERTENCIA: No opere la báscula de la aeronave sin haber leído y comprendido el manual de operación. |
|  | ADVERTENCIA: No realice alteraciones o modificaciones a la báscula de la aeronave. |
|  | ADVERTENCIA: No cambie las pilas cuando pueda existir una atmósfera explosiva. |
|  | ADVERTENCIA: No cambie el fusible cuando pueda existir una atmósfera explosiva. |
|  | ADVERTENCIA: No abra la báscula ni realice mantenimiento cuando pueda existir una atmósfera explosiva. |
|  | ADVERTENCIA: No mezcle pilas viejas y nuevas o pilas de diferentes fabricantes. |
|  | ADVERTENCIA: Si la báscula está alimentada desde una fuente de alimentación externa, debe estar conectada a través de una interfaz protectora para mantener la protección intrínseca. |
|  | ADVERTENCIA: No desconecte el conector de datos / alimentación externa cuando esté energizado. |
|  | ADVERTENCIA: No utilice el puerto serie RS485. Para acceder a los datos de forma remota, utilice la conexión de radio. |

ESPAÑOL - CONDICIONES ESPECÍFICAS DE USO

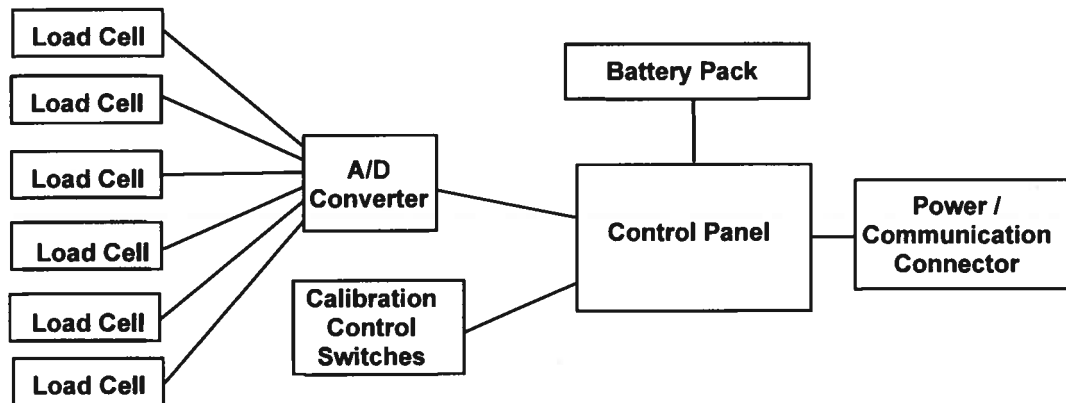
| | |
|---|--|
|  | ADVERTENCIA: Solo utilice la batería Duracell Tipo MN1500, Tamaño: AA (LR6), 1.5 V (Nom) de Alcalina-Manganeso Dioxide (Zn/MnO ₂). |
|  | ADVERTENCIA: La báscula contiene aluminio y se considera que constituye un riesgo potencial de ignición por impacto o fricción. Debe observarse precaución durante la instalación y el uso para evitar impactos o fricción. |
|  | ADVERTENCIA: El recinto contiene una ventana construida de plástico. Para prevenir el riesgo de chispas electrostáticas, la superficie de plástico solo debe limpiarse con un paño húmedo. |
|  | ADVERTENCIA: La báscula no pasará una prueba de aislamiento de 500 VRMS entre el circuito y el marco del circuito. Esto debe tenerse en cuenta durante la instalación, por ejemplo, mediante el uso de un conductor de enlace a tierra para la barrera de tierra. |

THEORY OF OPERATION

LOAD SENSOR

The load to be measured is applied to the top of the platform (active weighing surface). The load is coupled to the load cells. When the load is centered on the platform, each load cell receives one sixth of the applied load. The load cells produce an output signal proportional to the applied load. The output signal can vary from 0 millivolts for no load to approximately 3 millivolts for a full load at the load cell. The load cells contain circuitry to compensate for changes in temperature in the weighing environment. There are no field serviceable components inside a load cell. The load cell must be replaced if found to be defective.

SYSTEM SCHEMATIC DIAGRAM



CONTROL PANEL

The control panel performs the following functions.

WEIGHT CALCULATION

1. Each load cell signal is read individually. Weight information is transmitted several times a second.
2. The load cell signals are combined digitally using corner compensation calibration.
3. Local latitude and altitude settings may be entered or verified for each weighing if required.
4. The control panel applies a multi-point calibration factor that is calculated during the calibration procedure. The result is converted into the selected unit of measure and graduations and displayed on the indicator screen.

THEORY OF OPERATION

Control Panel (continued)

CONTROL PANEL INTERFACES

A light sensor is mounted next to the LCD display. The sensor automatically turns on a display backlight in response to ambient lighting conditions. The control panel also houses the control switches. The switches are used to turn the scale ON/OFF, ZERO the scale, select pound or kilogram weight unit of measure displayed, and set the scale operating parameters.

POWER CONTROL

The control panel conditions the input power received through the power connector. The external input is designed to accept a AC power supply with an output of 6 VDC. The battery indicator on the upper left corner of the control panel screen displays the battery level when running on battery power. When the battery voltage drops to a low level the "Lo.BAt" message will be displayed.

DATA COMMUNICATIONS

The control panel can communicate with an external computer using RS-485 signals routed through the COM connector or using the system wireless communication network. The data is transmitted in a compressed format designed to reduce communications time. All scale functions may be controlled through the COM connector port.

THEORY OF OPERATION

SCALE SETUP

1. Check for visible damage to the control panel and display unit. Verify that the scale is within the calibration interval.
2. Select a power source. The weighing system can receive power from the following sources.

BATTERY POWER

The scale operates using (4) AA-size alkaline batteries. Expected battery life can be between 150 to 200 hours depending on several factors including backlight use and wireless operation.

AC POWER

The scale can operate using an AC power supply with a 6 VDC output as shown in the Connection Diagram section found near the end of the manual. Please note that the scale requires 0.25 Amp operation peak current.

3. Position the scales. Weighing accuracy is dependent upon proper scale placement. Verify each scale is level and the active weighing surface is centered on the wheel of the aircraft.



ATTENTION: The floors should be level to 1/4 inch per foot (1.2°). It is possible to compensate for greater slopes mathematically, but a level surface is preferred. Scale level can be checked using a carpenter level. Each scale must be in full contact with the supporting surface. A pothole, uneven floor or use of shim stock under the scale can damage the scale.

4. Turn the scales on.
5. Push or tow the aircraft onto the scales. Verify each tire is centered on the active weighing surface of the scale.



ATTENTION: The aircraft brakes should be released, when weighing using platforms scales. Chocks may be used to control the aircraft during weighing and reduce the possibility of sideways stress causing weight shift during measurements.

6. When the aircraft is positioned correctly on the scales and the weight has stabilized, record the weight displayed on the indicator screen.

LATITUDE AND ALTITUDE CORRECTION

OVERVIEW

Latitude and Altitude gravitational effects can influence the weight displayed by the scale. For example, a scale with a weight applied that is located in a mountainous region of North America will have different gravitational influences (and weight displayed) than a scale located at sea level in a tropical location.

The AC60-LP-IS Aircraft Platform Scale has the capability to enter corrections for local variations in gravitational influences. When the proper Latitude and Altitude settings are entered, the AC60-LP-IS will adjust the displayed weight to reflect the current location for Latitude and Altitude. Latitude and Altitude setting adjustments are referenced in the MODE Menu section.

Latitude and Altitude setting should be adjusted whenever the scales are moved to a new location or the scale has undergone calibration.

LATITUDE AND ALTITUDE CORRECTION VALUES

| deg\ft | 0 | 1000 | 2000 | 3000 | 4000 | 5000 | 6000 | 7000 |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0 | 1.0027 | 1.0028 | 1.0029 | 1.0030 | 1.0031 | 1.0032 | 1.0033 | 1.0034 |
| 5 | 1.0026 | 1.0027 | 1.0028 | 1.0029 | 1.0030 | 1.0031 | 1.0032 | 1.0033 |
| 10 | 1.0025 | 1.0026 | 1.0027 | 1.0028 | 1.0029 | 1.0030 | 1.0031 | 1.0032 |
| 15 | 1.0023 | 1.0024 | 1.0025 | 1.0026 | 1.0027 | 1.0028 | 1.0029 | 1.0030 |
| 20 | 1.0021 | 1.0022 | 1.0023 | 1.0024 | 1.0025 | 1.0025 | 1.0026 | 1.0027 |
| 25 | 1.0017 | 1.0018 | 1.0019 | 1.0020 | 1.0021 | 1.0022 | 1.0023 | 1.0024 |
| 30 | 1.0014 | 1.0015 | 1.0016 | 1.0017 | 1.0017 | 1.0018 | 1.0019 | 1.0020 |
| 35 | 1.0009 | 1.0010 | 1.0011 | 1.0012 | 1.0013 | 1.0014 | 1.0015 | 1.0016 |
| 40 | 1.0005 | 1.0006 | 1.0007 | 1.0008 | 1.0009 | 1.0010 | 1.0011 | 1.0012 |
| 45 | 1.0000 | 1.0001 | 1.0002 | 1.0003 | 1.0004 | 1.0005 | 1.0006 | 1.0007 |
| 50 | 0.9996 | 0.9997 | 0.9998 | 0.9999 | 1.0000 | 1.0001 | 1.0002 | 1.0003 |
| 55 | 0.9991 | 0.9992 | 0.9993 | 0.9994 | 0.9995 | 0.9996 | 0.9997 | 0.9998 |
| 60 | 0.9987 | 0.9988 | 0.9989 | 0.9990 | 0.9991 | 0.9992 | 0.9993 | 0.9994 |
| 65 | 0.9983 | 0.9984 | 0.9985 | 0.9986 | 0.9987 | 0.9988 | 0.9989 | 0.9990 |
| 70 | 0.9980 | 0.9981 | 0.9982 | 0.9983 | 0.9984 | 0.9985 | 0.9986 | 0.9987 |
| 75 | 0.9978 | 0.9979 | 0.9979 | 0.9980 | 0.9981 | 0.9982 | 0.9983 | 0.9984 |
| 80 | 0.9976 | 0.9977 | 0.9978 | 0.9979 | 0.9979 | 0.9980 | 0.9981 | 0.9982 |
| 85 | 0.9974 | 0.9975 | 0.9976 | 0.9977 | 0.9978 | 0.9979 | 0.9980 | 0.9981 |
| 90 | 0.9974 | 0.9975 | 0.9976 | 0.9977 | 0.9978 | 0.9979 | 0.9980 | 0.9981 |

MENU

MODE MENU

Press the MODE switch to access the MODE Menu. The screen will display "LAlt". If the screen displays the message "SEtP", the scale is set in Calibration mode. The CAL Enable Jumper must be set in the Run position. Refer to the CAL Enable Jumper instructions in the Calibration section.

Some settings require a number (up to five digits) to be entered when the current number is displayed with a flashing digit. The number may be incremented by pressing the lb/kg switch. To move one digit to the left, press the ZERO switch. When the desired number has been entered, press the MODE switch. Settings are saved each time the MODE switch is pressed. The scale can then be turned off with no loss of the data saved to that point. Data is saved even if power is turned off

| STEP | FUNCTION | NOTE | DEFAULT |
|--------|-------------------------|---|---------|
| LAlt | Latitude | Increase or decrease in 5° increments | 45 |
| Alt | Altitude | Increase or decrease in 1000 ft increments | 0 |
| Print | Print | YES or NO | no |
| bltE | Backlight | ON, OFF or AUTO | AUTO |
| SEtP1 | Set Point 1 | 0 to 199999 | 199999 |
| SEtP2 | Set Point 2 | 0 to 199999 | 199999 |
| uEr. | Firmware Version | View Only | XXXXXX |
| A.r.t | Average Rate | 1 to 120 | 008 |
| AltHrS | Average Threshold | 1 to 10000 | 200 |
| AutoFF | Auto Off | 000 = OFF, 1 to 240 minutes | 060 |
| Print | Print Mode | 0 = On-Demand 1 = Continuous 2 = Accumulating Total Axle 3 = Accumulating Total Standard | 0 |
| PbAUD | Printer Baud Rate | 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 | 9600 |
| SC id | Scale ID | 1 - 190 | 001 |
| SCLS | Number of Scales | 1 - 32 | 01 |
| Proto | Protocol | StAnd, Lo Pr, C.LOOP, nonE | StAnd |
| ubAUD | Interface Baud Rate | 9600 or 115200 | 9600 |
| radio | Radio Enable | YES or NO | no |
| RF CH | Radio Channel | 01 to 12 | 01 |
| RF.PRN | Radio Network ID | 0 to 65534 | 08000 |
| RF.ECP | Radio Encryption Enable | YES or NO | no |
| | Radio Encryption Switch | 0 to 65534 | 00000 |
| RF.dEF | Restore Radio Defaults | 0 or 3 | 0 |



CAUTION: If the latitude and altitude setting cannot be edited, refer to Setting "L.R.d 5" in the Calibration Menu. The LAT/ALT function must be set to YES to display the settings and allow latitude and altitude editing.

MENU

MODE MENU SETTINGS

1. Press the MODE switch. The screen will display "LAT". Press the MODE switch. The current Latitude setting is displayed. Press the ZERO switch to decrease the setting in 5° increments or the lb/kg switch to increase the setting in 5° increments. The latitude setting range is adjustable to 90°. When the desired Latitude setting is displayed, press the MODE switch.
2. The screen will display "ALT". Press the MODE switch. The current Altitude setting is displayed. Press the ZERO switch to decrease the setting in 1000 foot increments or the lb/kg switch to increase the setting in 1000 foot increments. The altitude setting is adjustable to 7000 feet. When the desired Altitude setting is displayed, press the MODE switch.
3. The screen will display "PRINT". Press the MODE switch. The screen will flash "no". Use either the lb/kg switch or ZERO switch to toggle the Print setting between YES or NO. Enter YES to output a print ticket or line when the print option is installed. When the desired Print setting is displayed, press the MODE switch.
4. The screen will display "BLITE". Press the MODE switch. The current Backlight setting is displayed. Use the lb/kg switch or the ZERO switch to toggle the setting between ON, OFF or AUTO. When the desired Backlight setting is displayed, press the MODE switch.
5. The screen will display "SETP1". Press the MODE switch. The current Setpoint 1 setting is displayed. The setting reflects the level required to trip Setpoint 1 (S1). Use the lb/kg switch to advance the number and the ZERO switch to move the flashing digit to the left. When the desired Setpoint 1 setting is displayed, press the MODE switch.
6. The screen will display "SETP2". Press the MODE switch. The current Setpoint 2 setting is displayed. The setting reflects the level required to trip Setpoint 2 (S2). Use the lb/kg switch to advance the number and the ZERO switch to move the flashing digit to the left. When the desired Setpoint 2 setting is displayed, press the MODE switch.
7. The screen will display "VER.". Press the MODE switch. The current version of the firmware loaded in the scale is displayed. Press the MODE switch.
8. The screen will display "RATE". Press the MODE switch. The current Average Rate setting is displayed. The Average Rate setting is the number of readings that will be averaged together before the weight is displayed on the screen. Higher setting numbers will result in a more stable reading but will take longer to calculate the final value. The scale updates at 4Hz. An Average Rate of 8 equates to 2 seconds of averaging. Enter 1 to disable averaging. Use the lb/kg switch to advance the number and the ZERO switch to move the flashing number to the left. When the desired Average Rate setting is displayed, press the MODE switch.
9. The screen will display "RTHR5". Press the MODE switch. The current Average Threshold setting is displayed. The Average Threshold setting enables dynamic averaging which can improve the settling time of a large Average Rate. If the scale detects a large weight change, it will temporarily suspend averaging, skip to the new weight, and resume averaging. Enter a value from 1 to 10000 to set the threshold (in display divisions) at which point the dynamic averaging activates. Enter 0 to disable dynamic averaging. When disabled, the averaging will never be suspended. When the desired Average Threshold setting is entered, press the MODE switch.

MENU

MODE Menu Settings (continued)

10. The screen will display "A Off". Press the MODE switch. The current Auto Off setting is displayed. The flashing digit represents the number of minutes the scale can remain idle before automatically shutting down. The Auto Off setting can be set from 1 to 240 minutes. Setting the number at 0 will disable the function. When disabled, the scale will never automatically shut down. Use the lb/kg switch to advance the number and the ZERO switch to move the flashing digit to the left. When the desired Auto Off setting is displayed, press the MODE switch.
11. The screen will display "Print". Press the MODE switch. The current Print Mode setting is displayed when the print option is installed. The available Print Mode settings are referenced in the following table.

| SETTING | PRINT MODE |
|---------|------------------------------------|
| 0 | On-Demand |
| 1 | Continuous |
| 2 | Accumulating Total Axle Format |
| 3 | Accumulating Total Standard Format |

Use the lb/kg switch to increment the number and the ZERO switch to decrement the number. When the desired Print Mode setting is displayed, press the MODE switch.

12. The screen will display "Baud". Press the MODE switch. The current Printer Baud Rate setting is displayed when the Print option is installed. The available Baud Rate settings are referenced below.

| AVAILABLE BAUD RATE SETTINGS |
|---|
| 1200, 2400, 4800, 9600, 19200, 38400, 57600 115200 |

Use the lb/kg switch or the ZERO switch to toggle through the settings. When the desired Baud Rate setting is displayed, press the MODE switch.

13. The screen will display "Scale ID". Press the MODE switch. The Scale Identification number is displayed. The Scale ID can be set from a range of 1 to 190. Use the lb/kg switch to increment the number and the ZERO switch to move the flashing digit to the left. When the desired Scale ID number is displayed, press the MODE switch.
14. The screen will display "Scales". Press the MODE switch. The current Number of Scales in the system is displayed. Use the lb/kg switch to increment the number and the ZERO switch to move the flashing digit to the left. When the desired Number of Scales setting is displayed, press the MODE switch. The maximum number of scales that can be entered is 32.

MENU

MODE Menu Settings (continued)

15. The screen will display "Proto". Press the MODE switch. The current Protocol setting is displayed. There are (4) protocol settings that can be selected for the scale as referenced in the following table.

| SETTING | PROTOCOL |
|---------|--------------|
| StAnd | Standard |
| Lo Pr | Low Power |
| C.LOOP | Current Loop |
| nonE | Non-Network |

Standard Protocol is the default setting for use in wireless and wired scale networks. Low Power is an optional mode to improve wireless battery life but requires a special setup in the wireless host program for the mode to be operational. The maximum number of scales that can be connected in Low Power mode is 32. The Current Loop setting is not used in the AC60-LP-IS Platform Scale. When scales are not part of a totalizing network, battery life will be improved if "nonE" is selected. Use the lb/kg switch or the ZERO switch to cycle through the settings. When the desired Protocol setting is flashing, press the MODE switch

16. The screen will display "iBaud". Press the MODE switch. The current Interface Baud Rate setting is displayed. There are two settings available, 9600 and 115200. Use the lb/kg switch or the ZERO switch to toggle between the two settings. When the desired Baud Rate setting is flashing, press the MODE switch.
17. The screen will display "rAd io". Press the MODE switch. The current Radio Enable Status setting is displayed. The Radio Enable Status setting is either YES or NO. Use the lb/kg switch or the ZERO switch to toggle between the settings. When the desired Radio Enable setting is flashing, press the MODE switch. If NO is selected, the scale will skip the remaining radio settings and return to normal weighing.
18. The screen will display "rF CH". Press the MODE switch. The current Radio Channel setting is displayed. All scales in a system must be set to the same radio channel setting to communicate with each other. Use the lb/kg switch to increment the number and the ZERO switch to move the number to the left. When the desired Radio Channel setting is displayed, press the MODE switch.
19. The screen will display "rF.PRN". Press the MODE switch. The current Radio Network ID setting is displayed. All scales in a system must be set to the same Personal Area Network ID setting to communicate with each other. The ID setting can be selected from a range of numbers between 00000 and 65534. Use the lb/kg switch to increment the number and the ZERO switch to move the number to the left. When the desired Radio network ID setting is displayed, press the MODE switch.
20. The screen will display "rF.ECP". Press the MODE switch. The current Radio Encryption Enable Status is displayed. The status is set to either YES or NO. When enabled, Encryption adds an extra level of security to safeguard against unwanted eavesdropping. Use the lb/kg switch or the ZERO switch to toggle between the two settings. When the desired Radio Encryption Enable Status setting is flashing, press the MODE switch. If "YES" is selected, proceed to the next step. If "no" is selected, the scale will return to normal weighing.

MENU

MODE Menu Settings (continued)

21. The screen will display "00000" with the right digit flashing. Enter any number between 0 and 65534. The number entered is the Encryption Key setting. For security purposes, the Encryption Key setting is not accessible for viewing and will always be displayed as "00000". Use the lb/kg switch to increment the number and the ZERO switch to move the number to the left. Enter "00000" to leave the current setting unchanged. All scales in a system must be set to the same encryption key setting to communicate with each other. When the desired Encryption Key setting is entered, press the MODE switch.
22. The screen will display "rF.dEF". Press the MODE switch. The Radio Default setting "0" will be displayed. There are two Restore Radio Default settings; 0 (default setting) or 3. Select setting 3 to restore the Default Radio Settings (Radio Channel 1, Network ID 8000 and encryption disabled). Entering any other number will have no effect on the radio set-up. Use the lb/kg switch to increment the number and the ZERO switch to decrement the number. When the desired Radio Default setting is flashing, press the MODE switch. The scale will return to normal weighing



ATTENTION: If the scale does not have the radio option installed, the "rF CH", "rF PRn", "rF ECP" settings and the Encryption Key will not be active and will be View Only.

CALIBRATION

CALIBRATION OVERVIEW



CAUTION: Several steps in the calibration process require the use loading blocks. When using a force calibration press for calibration, the tip of the press may exert 70000 pounds of force. The AC60-LP-IS Scale is designed to accept a force of 70000 pounds across the entire scale area. However, the scale may not tolerate a force of 70000 pounds focused on a single point.

Loading blocks distribute the force over the load surface. During calibration, the force should be applied to the scale area much the same as if a tire were positioned on the scale. Intercomp recommends using an aluminum loading block (17.6 in x 18.0 in x 2 in) placed on top of a rubber pad (17.6 in x 18.0 in x 0.5 in).

1. The AC60-LP-IS Scale is calibrated at the factory prior to shipment.
2. Some settings require a number (up to five digits) to be entered when the number is displayed with a flashing digit. The number may be incremented by pressing the lb/kg switch. To move one digit to the left, press the ZERO switch. When the desired number has been entered, press the MODE switch. Settings are saved each time the MODE switch is pressed. The scale can then be turned off without losing the settings saved to that point.
3. When making verification runs on the scale, adjust the graduation size to increase the resolution of the scale to determine in or out tolerance readings. Refer to the Calibration Menu for instructions on changing the graduation size.
4. When the AC60-LP-IS is calibrated using dead weights, the correct altitude and latitude parameters must be entered. If the scale is calibrated using a force calibration press, the altitude parameters should be set to 0 feet and the latitude set to 45 degrees.

CALIBRATION

CALIBRATION VERIFICATION

TOOLS REQUIRED

| TOOL | PART NUMBER | DESCRIPTION |
|--------------------------|-------------|--|
| Force Calibration Press* | NA | Rated for scale capacity |
| Aluminum Loading Block | 144016 | 17.6 in (± 0.25 in) x 18.0 in (± 0.25 in) x 2.0 in Aluminum Calibration Block |
| Rubber Calibration Pad | 144017 | 17.6 in (± 0.25 in) x 18.0 in (± 0.25 in) x 0.5 in (± 0.125 in) (40 to 70 Shore A Rating) Rubber Calibration Pad |

* The calibration source (force calibration press or deadweights) must be able to accept a range from 10% to 100% of nominal scale capacity with a certified accuracy of 0.025% of reading or better.

CALIBRATION LOAD TABLES

The following load tables should be used when conducting a Calibration Verification of the AC60-LP-IS Scale.

CALIBRATION LOAD TABLES

| 60K Capacity | | | 70K Capacity | | |
|-----------------|------------------|------------------|-----------------|------------------|------------------|
| Test Force (lb) | Lower Limit (lb) | Upper Limit (lb) | Test Force (lb) | Lower Limit (lb) | Upper Limit (lb) |
| 0 | 0 | 0 | 0 | 0 | 0 |
| 6000 | 5995 | 6005 | 7000 | 6990 | 7010 |
| 12000 | 11990 | 12010 | 14000 | 13990 | 14010 |
| 18000 | 17985 | 18015 | 21000 | 20980 | 21020 |
| 24000 | 23980 | 24020 | 28000 | 27970 | 28030 |
| 30000 | 29970 | 30030 | 35000 | 34960 | 35040 |
| 36000 | 35965 | 36035 | 42000 | 41960 | 42040 |
| 42000 | 41960 | 42040 | 49000 | 48950 | 49050 |
| 48000 | 47955 | 48045 | 56000 | 55940 | 56060 |
| 54000 | 53950 | 54050 | 63000 | 62940 | 63060 |
| 60000 | 59940 | 60060 | 70000 | 69930 | 70070 |
| 0 | -5 | 5 | 0 | -10 | 10 |

CALIBRATION

Calibration Verification (continued)

CALIBRATION VERIFICATION PROCEDURES

1. Transport the scales to the calibration site. If there is more than a 5°F difference in temperature between the scale temperature and the calibration site, allow the scale to reach room temperature before applying power.
2. Position the scale on the calibration fixture. Turn the scale on. Allow the scale to warm up for a minimum of 3 minutes to stabilize the scale electronics.
3. Center the rubber pad and aluminum loading block on the active weighing surface of the scale.
4. Refer to the preceding Load Verification tables for the specific forces to be applied to the scale.
5. Apply each force and record the reading displayed on the scale:
6. Verify that each displayed value is within the limits referenced in the Load Verification table.
7. If the values recorded are within the referenced tolerances, continue to Corner Verification.
8. If any value is outside the acceptable limits set forth in the Load Tables, the scale requires calibration. Complete the entire Adjust Calibration procedure.

CORNER CALIBRATION VERIFICATION

The Corner Calibration is set at the factory prior to shipment. It may be necessary to adjust the corner settings after replacing a load cell. Corners must be checked if the unit fails the Calibration Verification check.

There are six load cells located beneath the active weighing surface of the AC60-LP-IS scale. Figure 1 depicts the load cell positions inside the scale.

AC60-LP-IS LOAD CELL POSITIONS



FIGURE 1

CALIBRATION

Calibration Verification (continued)

TOOLS REQUIRED

| TOOL | PART NUMBER | DESCRIPTION |
|-------------------------|-------------|---|
| Force Calibration Press | NA | Rated for 5000 pounds |
| Aluminum Loading Block | 100027 | 8 in (± 0.25 in) x 8 in (± 0.25 in) x 2.0 in (± 0.125 in) Aluminum Calibration Block |
| Rubber Calibration Pad | 100028-A | 8 in (± 0.25 in) x 8 in (± 0.25 in) x 0.5 in (± 0.125 in) Rubber Pad (40 to 70 Shore A rating) |
| Phillips Screwdriver | 140208 | #2 Phillips Screwdriver |
| Test Station | 140210 | Static Dissipation Station |

* The calibration source (force calibration press or deadweights) must be able to accept a range from 10% to 100% of nominal scale capacity with a certified accuracy of 0.025% of reading or better.

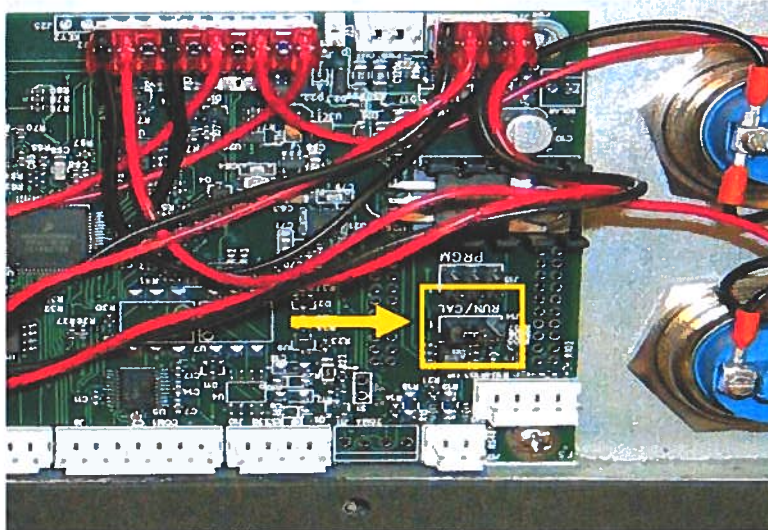
CORNER CALIBRATION VERIFICATION

1. Position the rubber pad and loading block on the corner to be verified. Refer to Figure 1 for load cell locations.
2. Apply 5000 lb to the loading block. Record the reading.
3. Repeat steps 1 and 2 for the remaining five positions.
4. If all readings are within 10 pounds the scale can be turned off and returned to normal weighing mode.
5. If multiple corner checks fail, perform the Multiple Corner adjustment procedure. If a single corner fails complete the Single Corner adjustment procedure.

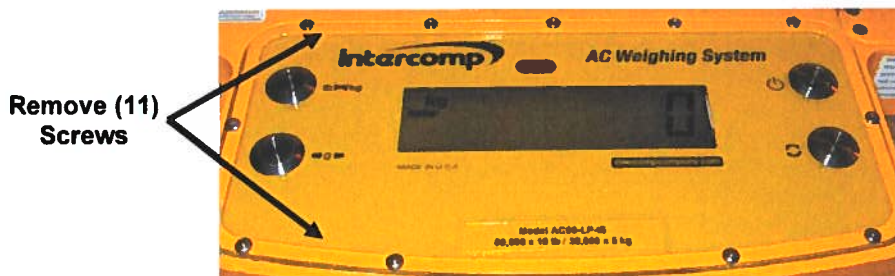
CALIBRATION

CALIBRATION ENABLE JUMPER

The Calibration Enable (RUN/CAL) Jumper is a safeguard to prevent unauthorized or accidental adjustment of calibration settings. Prior to calibrating the scale, the jumper must be moved to the CAL position. The RUN/CAL jumper is located near the lower right corner of the Main Display circuit board (Intercomp, A/D 20 BIT rev E) as shown in the photo. The jumper must be moved from shorting pins 2 and 3 (RUN) to pins 1 and 2 (CAL).



Access to the RUN/CAL jumper is accomplished by removing the (11) screws securing the indicator frame and control panel assembly to the scale housing. Carefully lift the control panel up and place it display side down on top of the weighing platform.



When calibration has been completed, return the Calibration Enable Jumper to the RUN position (shorting pins 2 and 3). Reinstall the control panel in the scale housing. Secure the indicator frame and control panel assembly using the (11) screws initially removed. The calibration settings are now safeguarded from unauthorized access.



CAUTION: Ensure the wire harness is seated properly to prevent damage to the harness from pinching between the display assembly and the scale casing.

CALIBRATION

CALIBRATION ADJUSTMENT



CAUTION: The following procedures must be performed at a Static Controlled Workstation. The control panel electronics may be subject to damage from electrostatic discharge.



CAUTION: Avoid direct contact with exposed circuitry. Use cotton gloves or similar protection when working with circuits. Oils from fingers may cause unacceptable performance in high humidity conditions. Degradation may not be obvious at the time of contamination. If circuitry becomes contaminated, clean using isopropanol or an equivalent cleaner.



CAUTION: Replacing or repairing a circuit board or load cell may affect calibration. Calibration should be verified after a part has been repaired or replaced.

SET MULTIPLE CORNERS

The Corner Calibration is set at the factory at time of shipment. It may be necessary to adjust the corner settings after replacing a load cell or printed circuit board. Corner calibration must be checked if the unit fails the calibration verification check.

There are six load cells located beneath the active weighing surface of the AC60-LP-IS scale. Figure 2 depicts the load cell positions inside the scale.

AC60-LP-IS LOAD CELL POSITIONS



FIGURE 2

CALIBRATION

Calibration Adjustment (continued)

TOOLS REQUIRED

| TOOL | PART NUMBER | DESCRIPTION |
|---------------------------|-------------|--|
| Force Calibration Source* | NA | Rated for 5000 lbs |
| Aluminum Loading Block | 100027 | 8 in (± 0.25 in) x 8 in (± 0.25 in) x 2.0 in Aluminum Calibration Block |
| Rubber Calibration Pad | 100028-A | 8 in (± 0.25 in) x 8 in (± 0.25 in) x 0.5 in (± 0.125 in) (40 to 70 Shore A Rating) Rubber Pad |
| Test Station | 140210 | Static Dissipation Station |
| Phillips Screwdriver | 140208 | #2 Phillips Screwdriver |

* The calibration source (force calibration press or deadweights) must be able to accept a range from 10% to 100% of nominal scale capacity with a certified accuracy of 0.025% of reading or better.

MULTIPLE CORNER ADJUSTMENT PROCEDURE

1. Press the ON/OFF switch to turn the scale ON
2. Press the MODE switch. The screen should display "STEP". If the screen displays "LRt", the scale is in Normal mode. The CAL Enable Jumper must be set in the CAL position. Refer to the CAL Enable Jumper section.
3. The screen will display "000". Press the lb/kg switch to increase the number until the screen displays "003". The Load Cell Balance procedure can now be accessed. Press the MODE switch.
4. The screen displays "LC.bRL". Press the MODE switch. The screen will display a single flashing digit representing the number of load cells installed in the scale. Use the lb/kg switch to increase the setting or the ZERO switch to decrease the number until the screen displays "5" (the number of load cells installed in the scale). If the number is changed, the scale will save the setting and restart. If the scale restarts, go back to step 2 and resume the process. If the initial number displayed is not changed, the screen will display the message "LC 00".
5. Press the MODE switch to display the Zero load. Loading blocks are not required for this step.
6. The screen will display "LC 1-0". Position the loading block and rubber pad on Load Cell position #1 as referenced in Figure 2. With no weight on the scale except the loading block and pad, press the MODE switch.
7. The screen will display "LC 1-L". Apply 5000 lb (2500 kg) to Load Cell #1. When the load is applied press the MODE switch.
8. The screen will display "LC2-0". Position the loading block and rubber pad on Load Cell position #2 as referenced in Figure 2. With no weight on the scale except the loading block and pad, press the MODE switch.
9. The screen will display "LC2-L". Apply 5000 lb (2500 kg) to Load Cell #2. When the load is applied press the MODE switch.

CALIBRATION

Calibration Adjustment (continued)

10. The screen will display "LC3-0". Position the loading block and rubber pad on Load Cell position #3 as referenced in Figure 2. With no weight on the scale except the loading block and pad, press the MODE switch.
11. The screen will display "LC3-L". Apply 5000 lb/f (2500 kg) to Load Cell #3. When the load is applied press the MODE switch.
12. The screen will display "LC4-0". Prepare load cell #4 using the loading block and the rubber pad referenced in Figure 2. Verify no weight is on the scale except the loading block and pad. Press the MODE switch.
13. The screen will display "LC4-L". Apply 5000 lb/f (2500 kg) to Load Cell #4. When the load is applied press the MODE switch.
14. The screen will display "LC5-0". Prepare load cell #5 using the loading block and the rubber pad referenced in Figure 2. Verify no weight is on the scale except the loading block and pad. Press the MODE switch.
15. The screen will display "LC5-L". Apply 5000 lb/f (2500 kg) to Load Cell #5. When the load is applied press the MODE switch.
16. The screen will display "LC6-0". Prepare load cell #6 using the loading block and the rubber pad referenced in Figure 1. Verify no weight is on the scale except the loading block and pad. Press the MODE switch.
17. The screen will display "LC6-L". Apply 5000 lb/f (2500 kg) to Load Cell #6. When the load is applied press the MODE switch.
18. The screen will display "SRUE" and then return to normal weighing mode. The cornering has been internally compensated and saved. Return to the Calibration Verification section and verify all calibration parameters are within established specifications.

When calibration has been completed, return the Calibration Enable Jumper to the RUN position (shorting pins 2 and 3). Reinstall the control panel in the scale housing. Secure the indicator frame and control panel assembly using the (11) screws initially removed. The calibration settings are now safeguarded from unauthorized access.



CAUTION: Ensure the wire harness is seated properly to prevent damage to the harness from pinching between the display assembly and the scale casing.

CALIBRATION

SINGLE CORNER ADJUSTMENT

If only one corner failed during the Corner Verification Check, perform the Single Corner Adjustment on the corner that failed.

1. Press the ON/OFF switch to turn the scale on.
2. Position the rubber pad and loading block on the corner to be adjusted.
3. Press the MODE switch to access the CAL mode. The screen should display "5EEP". If the screen displays "L#E", the scale is in Normal mode. The CAL enable switch must set to CAL mode. Refer to the CAL Enable Switch procedure in the Calibration section.
4. When "5EEP" is displayed, enter "20x" to adjust a single corner. The "x" represents the load cell number to be adjusted. For example, enter "202" to enter the mode required to adjust cell #2).
5. The display will appear to return to normal mode, except now the S1 and S2 indicators are blinking, signifying the selected corner is set in the Corner Adjust mode.
6. Apply 5000 lb/f (2500 kg) to the loading block and rubber pad positioned over the corner to be adjusted.
7. Press the lb/kg switch to increase or the ZERO switch to decrease the weight on the designated corner. Each time the lb/kg switch is pressed, the display is adjusted by approximately 0.01%.
8. When the desired weight is displayed, press the MODE switch to save the result and return to normal weighing. Return to the Calibration Verification section and verify all calibration parameters are met.

When calibration has been completed, return the Calibration Enable Jumper to the RUN position (shorting pins 2 and 3). Reinstall the control panel in the scale housing. Secure the indicator frame and control panel assembly using the (11) screws initially removed. The calibration settings are now safeguarded from unauthorized access.



CAUTION: Ensure the wire harness is seated properly to prevent damage to the harness from pinching between the display assembly and the scale casing.

CALIBRATION

CALIBRATION MENU

To initiate calibration of the AC60-LP-IS scale, press the MODE switch. The screen will display "5tEP". If the screen displays "LRt", the scale is in Normal mode. The CAL enable switch must set to CAL mode. Refer to the CAL Enable Switch procedure section.

Some settings require a number (up to five digits) to be entered when the current number is displayed in flashing mode. The number may be incremented by pressing the lb/kg switch. To move one digit to the left, press the ZERO switch. When the number has been entered, press the MODE switch. Settings are saved each time the MODE switch is pressed and the menu is advanced to the next step. The scale can then be turned off without losing the settings saved to that point.

| STEP | FUNCTION | NOTE | DEFAULT |
|-----------|---|---|---------|
| 5tEP | Skip | Refer to Cal Mode in Diagnostics Section | 000 |
| L.R.d .IS | Unit Will Display Latitude and Altitude On Power-up | YES or NO | YES |
| U. EnA | Unit Enable | YES or NO | YES |
| bP 1 | Grad Break Point 1 | Enter break point | 00000 |
| bP 2 | Grad Break Point 2 | Enter break point | 00000 |
| bP 3 | Grad Break Point 3 | Enter break point | 00000 |
| RdC.r.t | ADC Rate | 0 or 1 | 0 |
| AZt | AZT (AUTO ZERO TRACKING) | 1 d, 3 d, .5 d, oFF or .6 d | 1 d |
| ZErD.r | Zero Range | 0 = off, 1 = 1%, 2 = 2%, 3 = 5%, 4 = 1% | 0 |
| GrAd | Graduation Size | 0.02, 0.05, 0.1, 0.2, 0.5, 1, 2, 5, 10, 20, 50 or 100 | d 1 |
| inC 0 | Inclinometer Calibration | Not used in the AC60-LP-IS | 0 |
| | SRuE | Displays for 1 sec and advances | |
| CAP | Capacity | Enter scale capacity (60K Scale) | 60000 |
| | | Enter scale capacity (70K Scale) | 70000 |
| LL-00 | No Weight Applied | | |
| HH-01 | First Weight | Enter first weight | |
| LL-01 | First Weight | Load first weight | |
| HH-02 | Second Weight | Enter second weight | |
| LL-02 | Second Weight | Load second weight | |
| HH-02 | Third Weight | Enter third weight | |
| LL-03 | Third Weight | Load third weight | |
| HH-04 | Fourth Weight | Enter fourth weight | |
| LL-04 | Fourth Weight | Load fourth weight | |
| *** | Up to 10 Calibration Points | Minimum of a 3-Point calibration is recommended | *** |

CALIBRATION

CALIBRATION SETTINGS

1. At any point when setting calibration parameters, data will be retained by the scale at the step completed after the MODE switch is pressed. Data is saved even if power is turned off. To initiate calibration, press the MODE switch. The scale displays "5LEP". Press the MODE switch again. The screen displays "000" with the right digit flashing. To proceed through all of the calibration parameters, press the MODE switch when the screen displays "000". To skip to a specific Calibration parameter, refer to the Diagnostics Table under the Maintenance section for additional CAL Mode settings. Use the lb/kg switch to increment the number and the ZERO switch to move the number to the left. Press the MODE switch when the desired setting is displayed.
2. If proceeding through all calibration parameters, the screen will display the setting "L.A.d .5". Press the MODE switch. The screen will display YES or NO. Enter YES to display the Latitude and Altitude at start-up. Selecting YES will allow editing of the LAT/ALT settings in the MODE Menu. Enter NO to disable the ability to edit the latitude and altitude setting in the MODE Menu. Press the lb/kg switch or the ZERO switch to toggle the display between the two settings. When the desired setting is displayed, press the MODE switch.
3. The screen displays "U. EnA". Press the MODE switch. The scale will read the Units Switch Enable setting (YES or NO). YES, is the default setting and enables the Units Switch function (lb/kg switch). Enter NO to prevent switching between the lb/kg units of measure. Press the lb/kg switch or the ZERO switch to toggle the display between the YES and NO settings. When the desired setting is displayed, press the MODE switch.
4. The screen displays "bP 1". Press the MODE switch. The screen will display the current Break Point 1 setting. Use the lb/kg switch to advance the number and the ZERO switch to move the number to the left. When the desired Graduation Break Point 1 setting is displayed, press the MODE switch. Refer to the following Multiple Graduation Break Points section for further information.

CALIBRATION

Calibration Settings (continued)

MULTIPLE GRADUATION BREAK POINTS

The AC60-LP-IS scale can be set for multiple Graduation Break Point values. An example of a scale set for three Graduation Break Points is presented below.

| MULTIPLE GRADUATION BREAK POINTS | |
|--|--|
| Grad = Initial graduation equals by 0.1 lb | |
| Cap = 10000 (Capacity equals 10,000 lb) | |
| bP 1 = 1000 | |
| bP 2 = 2000 | |
| bP 3 = 5000 | |

Using the break point settings from the previous example, the scale would display the following information:

| WEIGHT (lb) | GRAD | WEIGHT (kg) | GRAD |
|------------------|-----------|---------------------|------------|
| up to 1000 lb | by 0.1 lb | up to 453.55 kg | by 0.05 kg |
| 1000+ to 2000 lb | by 0.2 lb | 453.55+ to 907.1 kg | by 0.1 kg |
| 2000+ to 5000 lb | by 0.5 lb | 907.1+ to 2267.8 kg | by 0.2 kg |
| 5000+ lb | by 1.0 lb | 2267.8+ kg | by 0.5 kg |

To disable the break points, the Graduation Break Point settings should be set to 0. The scale will operate normally using the same graduation from zero to capacity.

- The screen displays "bP 2". Press the MODE switch. Repeat the process in step 4 for Graduation Break Point 2. When the desired Graduation Break Point setting is displayed, press the MODE switch.
- The screen displays "bP 3". Press the MODE switch. Repeat the process in step 4 for Graduation Break Point 3. When the desired Graduation Break Point setting is displayed, press the MODE switch.
- The screen displays "AdCrL". Press the MODE switch. The current Analog to Digital Conversion Rate (ADC) setting is displayed. There are two settings available for the internal A/D conversion time. An entry of "0" will offer the full conversion time and provide the most stable results. An entry of "1" will result in a reduced conversion time which can extend battery life. Intercomp recommends the AC60-LP-IS be set to "0". Use the lb/kg switch to increment the number and the ZERO switch to decrement the number. When the desired ADC rate is displayed press the MODE switch.



CAUTION: If the ADC Rate setting is changed, the scale must be recalibrated.

CALIBRATION

Calibration Settings (continued)

8. The screen displays "AZT". Press the MODE switch. The current AUTO ZERO TRACKING (AZT) setting is displayed. Press the lb/kg switch or the ZERO switch to cycle through the available AZT settings.

AZT SETTINGS
0.5 d, 0.6 d, 1 d, 3 d, OFF

If the displayed weight is less than the number of grads shown for a given amount of time, the weight will be zeroed off. When the desired AZT setting is displayed, press the MODE switch.

9. The screen displays "ZER". Press the MODE switch. The current ZERO Range setting is displayed. Use the lb/kg switch to increment and the ZERO switch to decrement the number. The ZERO range is the percentage the zero can move from the original zero obtained at calibration.

The ZERO switch will not work if outside the ZERO Range. The message "ZER" will be displayed with the error icon illuminated if the ZERO Range is set to 1, 2 or 3. If a ZERO Range setting from 4 - 6 is entered, the ZERO switch will not function when an attempt is made to zero the scale outside the range. When the desired ZERO range setting is displayed, press the MODE switch.

ZERO RANGE SETTINGS
0=OFF
1=1%, 2=2%, 3=5%
4=1%, 5=2%, 6=5%

10. The screen displays "GRD". Press the MODE switch. The current Graduation setting is displayed with the number in flashing mode. Press the lb/kg switch or the ZERO switch to cycle through the available graduation settings. When the desired graduation setting is displayed press the MODE switch.

GRADUATION SETTINGS
0.02, 0.05, 0.1, 0.2, 0.5
2, 5, 10, 20, 50, 100

11. The screen displays "INC 0". The Inclinator Calibration setting is not used in the AC60-LP-IS Platform Scale. Press the MODE switch to continue.

12. The screen will display "SCALE" for approximately one second and advance to display "CRP". The scale is ready to proceed to the Weight (Force) Calibration section.

Changes made through step 11 of the calibration parameters are saved in memory and the scale can be turned off without proceeding to the Weight Calibration section.

CALIBRATION

WEIGHT CALIBRATION

The AC60-LP-IS scale employs a 10-Point calibration process. A multiple-point calibration improves the accuracy of the scale by compensating for the linearity characteristics of the load cells. One to ten load weights are required to conduct a multi-point calibration. Refer to the Theory of Multi-Point Span Correction tables at the end of the Calibration section to understand how using a multi-point calibration can be advantageous to improving the accuracy of the scale.

RECOMMENDED CALIBRATION POINTS FOR MULTI-POINT SPAN

| CAP | 10K | 30K | 60K | 70K |
|-------|-------|-------|-------|-------|
| HH-01 | 1000 | 3000 | 6000 | 7000 |
| HH-02 | 2000 | 6000 | 12000 | 14000 |
| HH-03 | 3000 | 9000 | 18000 | 21000 |
| HH-04 | 4000 | 12000 | 24000 | 28000 |
| HH-05 | 5000 | 15000 | 30000 | 35000 |
| HH-06 | 6000 | 18000 | 36000 | 42000 |
| HH-07 | 7000 | 21000 | 42000 | 49000 |
| HH-08 | 8000 | 24000 | 48000 | 56000 |
| HH-09 | 9000 | 27000 | 54000 | 63000 |
| HH-10 | 10000 | 30000 | 60000 | 70000 |

TOOLS REQUIRED

| TOOL | PART NUMBER | DESCRIPTION |
|--------------------------------|-------------|--|
| Force Calibration Press* | NA | Rated for scale capacity |
| Aluminum Loading Block | 144016 | 17.6 in (± 0.25 in) x 18.0 in (± 0.25 in) x 2.0 in Aluminum Calibration Block |
| Rubber Calibration Pad | 144017 | 17.6 in (± 0.25 in) x 18.0 in (± 0.25 in) x 0.5 in (± 0.125 in) (40 to 70 Shore A Rating) Rubber Calibration Pad |
| Phillips Screwdriver | 140208 | #2 Phillips Screwdriver |
| Static Dissipation Workstation | 140210 | Static Controlled Workstation |

* The calibration source (force calibration press or deadweights) must be able to accept a range from 10% to 100% of nominal scale capacity with a certified accuracy of 0.025% of reading or better.

CALIBRATION

Weight Calibration (continued)

WEIGHT CALIBRATION PROCEDURE

1. The screen displays "CAP". Press the MODE switch. Enter Capacity of the scale. Press MODE switch.
2. Position the aluminum load block and rubber pad on the active weighing surface of the scale.
3. The screen displays "LL-00". Verify there is no weight (except for the loading block and pad) applied to the scale. Press the MODE switch.
4. The screen displays "HH-0 1". Press the MODE switch. Enter the value of the first load to be applied in the lb unit of measure. Press the MODE switch.
5. The screen displays "LL-0 1". When the first load is applied to the scale, press the MODE switch. The screen will display "HH-02". Press the MODE switch. Enter the value of the second load to be applied in the lb unit of measure. Press the MODE switch.
6. The screen displays "LL-02". When the second load is applied to the scale, press the MODE switch. The screen displays "HH-03". Press the MODE switch. Enter the value of the third load to be applied in the lb unit of measure. Press the MODE switch.
7. The screen displays "LL-03". When the third load is applied to the scale, press the MODE switch. The screen displays "HH-04". If the third weight was the last calibration point, press the ON/OFF switch to turn off the scale and end the calibration procedure. If additional calibration points are to be entered, press the MODE switch and repeat the process for "HH-04 – HH- 10 and LL-04 – LL- 10".
8. The scale returns to normal weighing after "LL- 10" unless the calibration is completed at a lower calibration point. The calibration data is saved.



ATTENTION: If calibration has been started and the scale is turned off before load point "LL-0 1" has been completed, the scale will retain the old calibration information.

When calibration has been completed, return the Calibration Enable Jumper to the RUN position (shorting pins 2 and 3). Reinstall the control panel in the scale housing. Secure the indicator frame and control panel assembly using the (11) screws initially removed. The calibration settings are now safeguarded from unauthorized access.

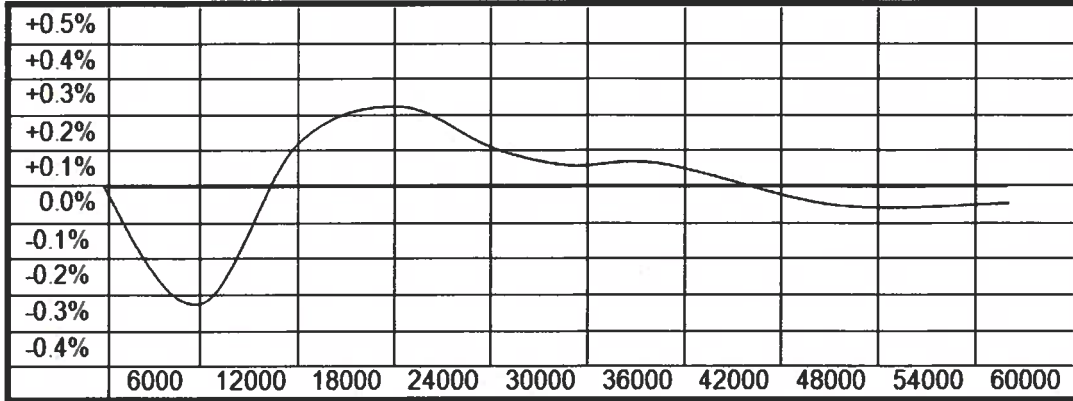


CAUTION: Ensure the wire harness is seated properly to prevent damage to the harness from pinching between the display assembly and the scale casing.

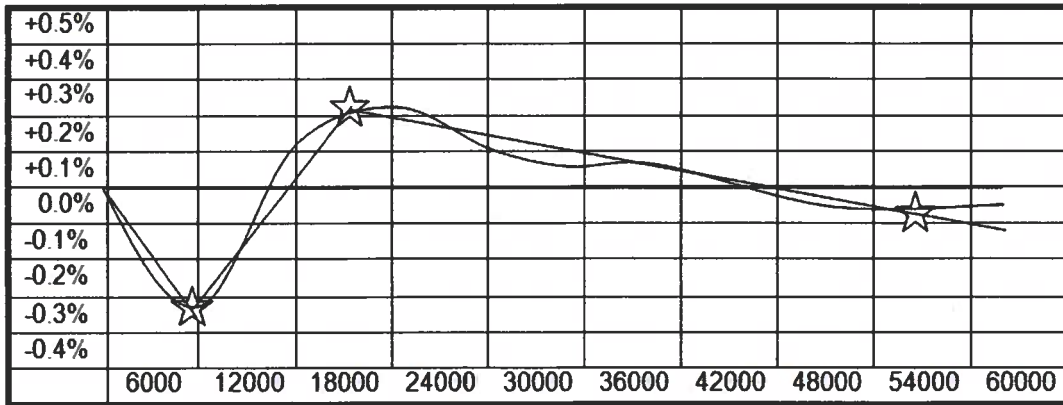
CALIBRATION

THEORY OF THREE POINT SPAN CALIBRATION

Large Uncorrected Error From Load Cell Assembly

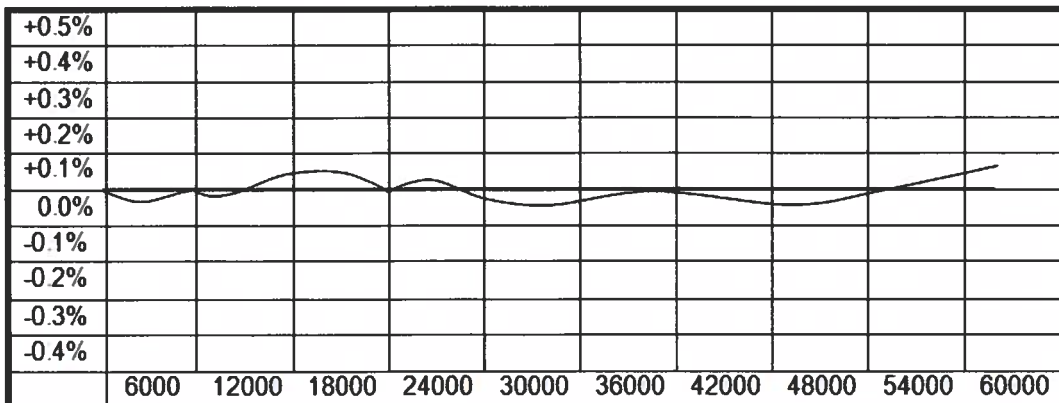


Three Points Selected to Match the Points of Greatest Change of Error



The Related Span Segments Are Plotted Through the Selected Calibration Points

Residual Error



TROUBLESHOOTING



CAUTION: Replacing or repairing a circuit board or load cell may affect calibration. Calibration should be verified after a part has been repaired or replaced.

ERROR MESSAGES

| MESSAGE | DEFINITION |
|-------------|---|
| EEPE | EEPROM FAILURE Calibration Information Lost or Corrupted Calibration information is held in a special permanent memory area. A checksum code is generated and written to the memory during the calibration process. Each time power is turned on the code is regenerated and compared to the stored value. If a change is detected, the error message is displayed. Recalibration may clear the error display. If problem persists, replace the control panel. |
| Rd I | A/D Converter Failure The A/D circuit board has detected a fault and will need to be repaired or replaced. |
| LCbxx | Power Up Self-Test Has Detected One or Multiple Load Cell Errors A load cell may have failed or there is a bad connection. The "xx" designation references the cell or connection that has failed. A single digit (xx = 1 – 8) denotes a single load cell failure. A two-digit value for the xx designation is a code to indicate multiple cells have failed or are disconnected. |
| LC xx | Run-Time Checking Has Detected One or Multiple Load Cell Errors A load cell circuit may have failed or there is a bad connection. The "xx" designation references the cell or connection that has failed. A single digit (xx = 1 – 8) denotes a single load cell failure. A two-digit value for the xx designation is a code to indicate multiple cells have failed or are disconnected. |
| Lo.bAt | Low Battery Voltage Output from the batteries is very low. Check batteries. Batteries may need to be replaced. If the battery voltage is correct, replace the control panel. |
| CAP | Overload Condition, Calibration Information Lost or Bad Load Cell The control panel has detected a weight reading that is larger than expected. Error may be caused by application of excess weight to the platform. If the message is displayed when there is no weight on the platform, a likely source may be a defective load cell or defective control panel. To isolate the problem, measure the signal across pins two and three on the control panel load cell connector. The reading should be between zero and one millivolt. If reading is higher or lower, inspect the load cell system. If the signal is within range, calibration data may be lost. Attempt to recalibrate the scale. If calibration does not clear the problem, replace the control panel. |
| ZErD.r | Zero Range Error Scale attempted to zero off a load outside the range specified in the zero range setting. Remove load and press the ZERO switch. |
| d ,SP | Number Cannot be Displayed (example: -99999) Common source of error is pressing the ZERO switch with a full load on the scale. When the load is removed, the full number with a minus sign will not fit on the display. Remove the load and press the ZERO switch again to clear display. |
| CDP or CLDC | Diagnostic Power-Up Message CDP and CLDC errors do not affect normal scale operation and can typically be ignored. |

TROUBLESHOOTING

PROBLEM TABLE

| SYMPTOM | DESCRIPTION |
|----------------|---|
| SYMPTOM | No Power Up. Blank Display |
| | If power reaches the control panel, the display driver turns on random segments. The display screen is blank. Potential Sources include: <ol style="list-style-type: none"> 1. Blown fuse on the protective interface PCB. Replace fuse. 2. Defective wiring harness. Inspect for damaged wiring. 3. Defective battery pack. Measure battery voltage, charge or replace if required 4. Defective ON/OFF switch. Bridge the ON/OFF switch to check if the scale powers up. 5. Defective circuitry. Replace control panel. <p>The power supply may be delivering power, but it could be diminished by a defective circuit board or cable. Unplug the load cell cable. If the scale powers up, a load cell lead may be shorted. Turn the power off and test each cell lead. Inspect for a damaged cable.</p> |
| SYMPTOM | Power Up to Random Display |
| | Power is reaching the display driver circuit, but the control panel is not working correctly. Test for low battery voltage. Inspect for visible damage. Replace the control panel if damage is detected or low battery conditions are not detected. |
| SYMPTOM | Scale Shuts Off |
| | If the scale turns off immediately when the ON/OFF switch is released, the cause may be low batteries. If battery power is sufficient, replace the control panel. |
| SYMPTOM | Locks Up |
| | The scale may be programmed incorrectly. Restore the correct control parameters. If the Average Rate setting is very high, an active load may not update the display quickly and may be interpreted as a lock up. |
| SYMPTOM | No Backlight |
| | The backlight parameter may be disabled (OFF). If the parameter is set to AUTO, cover the light sensor window. If the backlight does not turn on, replace the control panel. (Note that the backlight is not visible in bright sunlight.) |
| SYMPTOM | Slow Operation |
| | Slow operation may be caused by a programmed change in the filter setting resulting in a tradeoff between speed and stability of the display reading. The filter setting may be tuned by changing the Average Rate setting. |
| SYMPTOM | Low Battery Indicator Will Not Turn Off |
| | Output from the batteries is very low. Check batteries. Batteries may need to be replaced. If the battery voltage is correct, replace the control panel. |
| SYMPTOM | Jumpy or Drifty Weights |
| | May be traced to contamination on circuit boards or a bad load cell. May also be caused by a rapid change in temperature. The scale requires a minimum of one-hour acclimation time for each 10 degrees' Fahrenheit change in temperature. Another source could be powerful radio interference. |
| SYMPTOM | No Response to One or More Switches |
| | The switch may be defective. The control panel may be defective. The ZERO switch does not function when the scale is in motion is not a defect. The scale may be programmed to ignore the ZERO switch if the weight on the platform exceeds a specified amount. |

TROUBLESHOOTING

Troubleshooting Table (continued)

| SYMPTOM | DESCRIPTION |
|----------------|---|
| SYMPTOM | Bad Weights |
| | <ol style="list-style-type: none"> 1. Check the weighing process. Are there air currents around the vehicle being weighed? 2. Are operators using dummy pads on wheels not positioned on the scales? 3. Are the scales on level ground? 4. Is the scale set to the wrong unit setting? 5. Is a new operator using the scales? 6. If using a calibration press, are weight distribution blocks and rubber pads being used? 7. Is the reference scale correct? 8. Is the scale spanned correctly? If the reading is exactly 5/6 of the expected value, one of the load cell leads may not be providing signal, most likely in the load cell or control circuit. The interconnecting wiring or cables may be pinched, cut or damaged. There may be mechanical interference around the weighing platform. Remove the platform and inspect the load cell mounting and links. |

TROUBLESHOOTING

DIAGNOSTIC SETTINGS

The following Diagnostic Setting table offers a number of diagnostic codes to be used during Calibration and other scale diagnostic activities.

To access the Diagnostic Settings, the Calibration menu must be enabled. Verify the CAL Enable Switch is in the CAL Mode position. Press the MODE switch. The message "StEP" is displayed. Enter the desired CAL Mode setting from the selections referenced in the following table. Press the MODE switch to save the entry and access the specific Diagnostic CAL mode.

| CAL MODE | FUNCTION |
|----------|---|
| 000 | Advance through normal Calibration menu. |
| 001 | Advance to Weigh Calibration |
| 003 | Access Corner Calibration (also set the number of load cell inputs). |
| 005 | Access MODE Menu. This is same menu that is accessed when the cal strap is in the Normal Run position and Calibration Mode is disabled. |
| 101 | Angle display diagnostic. |
| 111 | Individual cell read diagnostic. Enter specific load cell number 1 - 8. |
| 121 | Raw Counts display diagnostic. |
| 131 | Constant power to all load cells diagnostic. |
| 201-208 | Corner adjust cell 1 - 8. (Example: Entering 202 will access mode to adjust cell #2). |
| 311 | Default and save all radio settings to the radio. |
| 711 | Default and save all settings excluding calibration and cornering settings. |
| 811 | Set and save corner compensation to factory default nominal values |
| 911 | ***CAUTION*** Restore and save all memory to factory default settings. |

TROUBLESHOOTING

DIAGNOSTIC TESTS AND VOLTAGE MEASUREMENTS

LAMP

1. Cover the light sensor window. If the light does not turn on, replace the control panel.



ATTENTION: The backlight is not visible in bright sunlight.

SWITCHES

1. Press the ON/OFF switch. The scale should turn on.
2. Press the lb/kg switch. The unit of measure displayed on the screen should change from lb to kg.
3. Apply a load to the scale between 50 lb and 250 lbs. When the weight displayed has stabilized, press the ZERO switch. The scale should display a Zero weight.
4. Press the ON/OFF switch. The scale should turn off.

POWER DOWN SHUTOFF

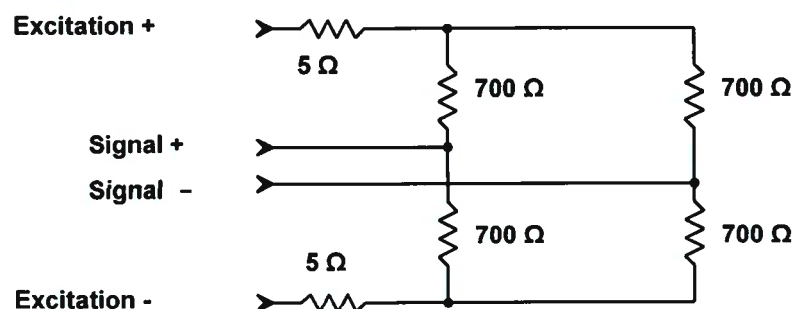
1. Connect a variable power supply to the input connector and remove the batteries.
2. Connect the meter to the positive battery lead.
3. Set the power supply to 6V and turn the scale on.
4. Reduce the input voltage until the scale turns off. The voltage at shutoff should be between 3.2 and 3.5 volts.

LOAD CELLS

The AC60-LP-IS Platform Scale has six load cells. The load cells are transducers that convert mechanical energy (weight) to electrical energy.

Each load cell has (4) strain gages ($700\ \Omega$) and two temperature compensation thermistors. The four strain gages are wired together to form a Wheatstone Bridge as depicted below.

WHEATSTONE BRIDGE SCHEMATIC DIAGRAM



TROUBLESHOOTING

Diagnostic Tests (continued)

The 5 Ω BALCO resistors installed in series with the Excitation leads are used for temperature compensation. BALCO resistors maintain a constant signal voltage by adjusting resistance with fluctuations in temperature. The BALCO resistors used in the AC60-LP-IS load cells are manufactured exclusively for Intercomp. The following table references the load cell lead color coding.

LOAD CELL LEAD COLOR CODES

| LEAD COLOR | FUNCTION |
|------------|--------------------------|
| RED | + Excitation (3.3 Volts) |
| GREEN | + Signal |
| WHITE | - Signal |
| BLACK | - Excitation (ground) |

CHECK LOAD CELL ZERO OUTPUT VALUE

The scale cycles power to the load cell to conserve battery life. To measure the Zero Output value, it is necessary to switch the cells to constant power during the measurement. Access the Calibration Mode Menu. When the message "STEP" is displayed, enter Diagnostic CAL Mode 131 to apply constant power to the load cells.

The signal at the main circuit board with the signal leads in place should be approximately 0.1 millivolts with no load applied to the cell. If a larger value is detected, it could indicate a defective load cell, wiring or circuit board. The load cell must be tested separately to determine the source of the Zero shift.

The constant power mode is cleared by cycling the ON/OFF switch at the end of the measurement.

CHECK LOAD CELL RESISTANCE VALUES

1. Load cell resistance can be checked when the load cell is disconnected from the scale. Set a variable power supply to 3.3 VDC to provide the excitation voltage for the resistance measurement. Connect +3.3 volts to the red lead. Connect ground to the black lead.



ATTENTION: The scale can be used to provide the excitation voltage with the two excitation leads (Black and Red) connected. Turn on the scale to apply the excitation voltage.

2. The scale will cycle power to the load cell to conserve battery life. It will be necessary to switch the load cells to constant power to conduct the resistance measurement.
3. Access the Calibration Menu. When the message "STEP" is displayed, enter Diagnostic Cal Mode 131 to apply constant power to the load cells. The constant power mode is cleared by cycling the ON/OFF switch at the end of the measurement.
4. Connect a meter capable of measuring millivolt readings between the positive and negative signal leads (Green and White). The zero signal output with excitation voltage applied should measure between -1.00 to +1.00 millivolts. A larger value would indicate a defective load cell, most likely the result of an overload of the load cell during use.

TROUBLESHOOTING

Check Load Cell Resistance Values (continued)

5. Load cell resistance can vary depending on the model and capacity of the cell. Load cell resistance will be one of the standard values referenced in the following table.

| NOMINAL CELL RESISTANCE | | 350 Ω | 700 Ω | 1000 Ω |
|-------------------------|---|--------------|--------------|---------------|
| Black - Red | = | 385 Ω | 770 Ω | 1082 Ω |
| Black - Green | = | 285 Ω | 595 Ω | 748 Ω |
| Black - White | = | 285 Ω | 595 Ω | 748 Ω |
| White - Green | = | 350 Ω | 701 Ω | 1000 Ω |

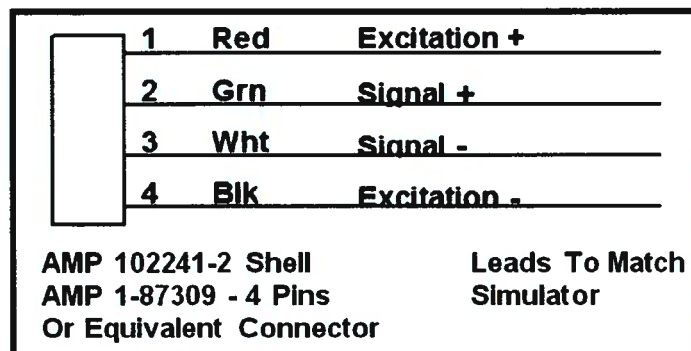
6. With the load cell disconnected from the control board, measure the Load Cell resistance. It is normal for all of the readings to be higher or lower (by several percent) than the values referenced in the preceding table. If there is difference of several Ohms between the Black-Green and Black-White measurements, the load cell is defective, indicating either an open or short.

USING A LOAD CELL SIMULATOR

During checkout it may be difficult to apply the weight required to develop internal signals. A load cell simulator may be connected to the load cell connector located on the control panel to simulate the required signals.

A simulator set for an output of 1.3 mV/V will generate approximately the same signal as a 20000-pound load. The simulator can be connected to the four pin load cell connector depicted in the following schematic.

SIMULATOR CABLE CONNECTION SCHEMATIC



WARNING: A load cell simulator should not be used to calibrate the scale. The simulator is to be used for Diagnostic Purposes Only.

MAINTENANCE

GENERAL MAINTENANCE

Intercomp recommends that the following items be included in the AC60-LP-IS Scale Service Department.

RECOMMENDED TOOLS

| TOOL | PART NUMBER | DESCRIPTION |
|--------------------------------|-------------|---|
| Force Calibration Press* | NA | Rated for scale capacity |
| Aluminum Loading Block | 144016 | 17.6 in (± 0.25 in) x 18.0 in (± 0.25 in) x 2.0 in Aluminum Calibration Block |
| Rubber Calibration Pad | 144017 | 17.6 in (± 0.25 in) x 18.0 in (± 0.25 in) x 0.5 in (± 0.125 in) (40 to 70 Shore A rating) |
| Aluminum Loading Block | 100027 | 8 in (± 0.25 in) x 8 in (± 0.25 in) x 2.0 in (Calibration Loading Block) |
| Rubber Calibration Pad | 100028-A | 8 in (± 0.25 in) x 8 in (± 0.25 in) x 0.5 in (± 0.125 in) (40 to 70 Shore A rating) |
| Static Dissipation Workstation | 140210 | Static Dissipation Workstation |
| Load Cell Simulator | NA | Used to Troubleshoot Scale Issues |
| Allen Wrench | NA | 3/8 in Allen Wrench |
| Phillips Screwdriver | 140208 | #2 Phillips Screwdriver |
| Torx T30 Bit | 683001 | T30 Torx 3/8 in Drive Bit Socket |
| Torx T30 Wrench | 683017 | Torx T30 Wrench / Driver |
| Torque Wrench | NA | Torque Wrench - 15 ft-lbs |
| Loctite 242 | 830066 | Loctite 242 Removable Threadlocker, BLUE, 50 ml |
| RTV Adhesive Sealant | 830056 | Dow-Corning #748 Non-Corrosive RTV Adhesive/Sealant, 300 ml |
| Solder iron | NA | Small soldering iron |
| Rosin Solder | NA | 0.031 in Resin Core Solder. Do Not Use NO CLEAN Type Solder |

* The calibration source (force calibration press or deadweights) must be able to accept a range of 10% to 100% of nominal scale capacity with a certified accuracy of 0.025% of reading or better.

MAINTENANCE

General Maintenance (continued)

CONSUMABLE AND SPARE PARTS

Intercomp recommends stocking the following items as consumable and spare parts.

| PART | PART NUMBER | DESCRIPTION |
|----------------------------|--------------------------|---|
| Duracell Battery | 3301762 | Duracell MN1500 Battery (IEC-LR6/ANSII-15A/Size AA) |
| Fuse | 3301765 | Fuse_Intrinsically Safe_259-ul913 0.125 |
| Protective Interface Board | 0200138 | Protective Interface Board Assembly |
| Control Panel | Dependent on Scale Model | Control Panel Assembly - Spare |
| Harness Assembly | 0200139 | Power & Communications, AC60-LP-IS |
| Load Cell* | Varies | Load Cell - Spare |

* Load cells are available for specific cell positions and are supplied with connectors and leads cut to length.



CAUTION: General maintenance procedures should be performed at a Static Controlled Workstation. The control panel electronics may be subject to damage from electrostatic discharge.



CAUTION: Avoid direct contact with exposed circuitry. Use cotton gloves or similar protection when working with circuits. Oils from fingers may cause unacceptable performance in high humidity conditions. Degradation may not be obvious at the time of contamination. If circuitry becomes contaminated, clean using isopropanol or an equivalent cleaner.

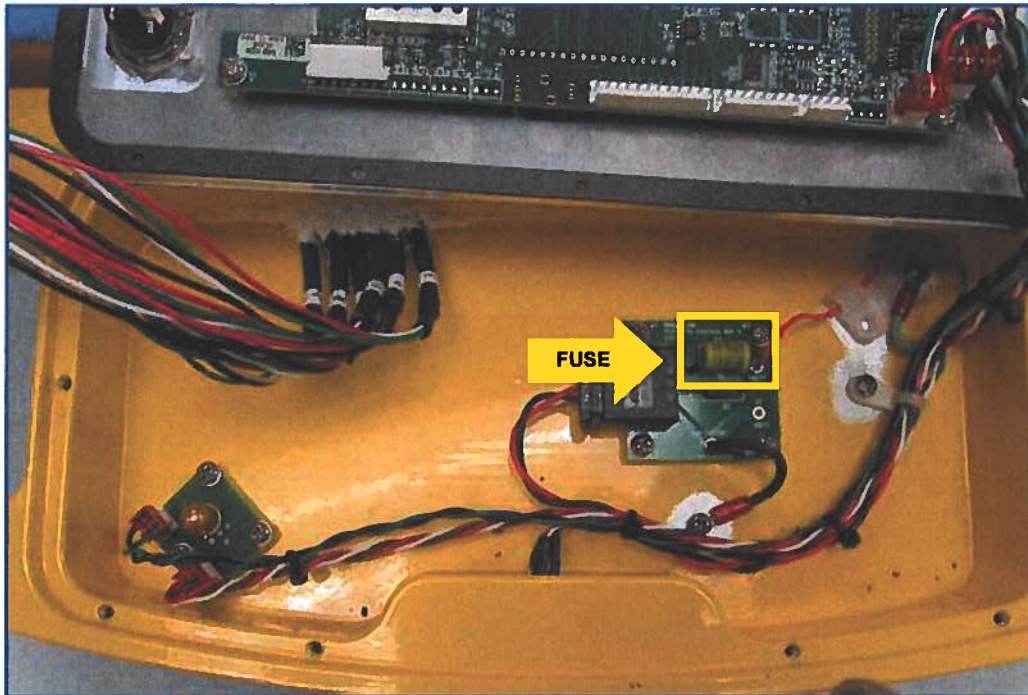


CAUTION: Replacing or repairing a circuit board or load cell may affect calibration. Calibration should be verified after a part has been repaired or replaced.

MAINTENANCE

CHANGING THE FUSE

1. Turn the scale off.
2. Remove the (11) screws securing the indicator frame and control panel to the scale housing
3. Carefully remove the panel assembly.
4. Locate the fuse as shown in the photo.



5. Remove the fuse by gripping it firmly and pulling straight up.
6. Carefully align the new fuse with the socket pins of the protective interface board. Push the fuse into the socket until flush with the circuit board.
7. Reinstall the control panel assembly in the scale housing. Secure the control panel and indicator frame using the (11) screws previously removed.

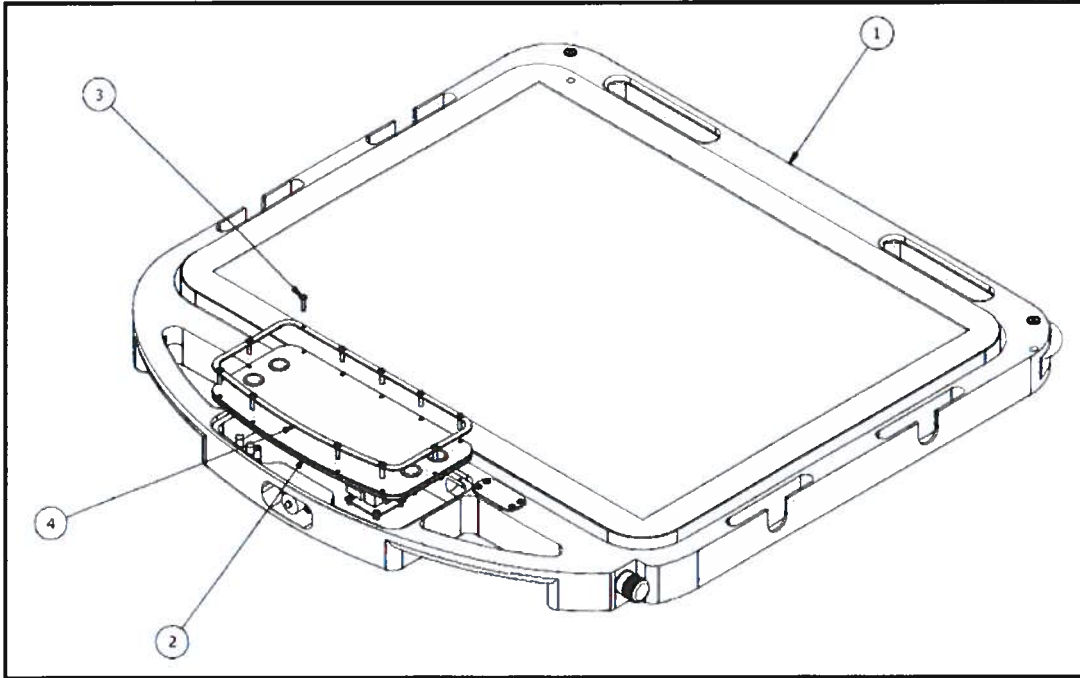


CAUTION: Ensure the wire harness is seated properly to prevent damage to the harness from pinching between the display assembly and the scale casing.

8. Press the ON/OFF switch. The scale should turn on.

ILLUSTRATED PARTS BREAKDOWN

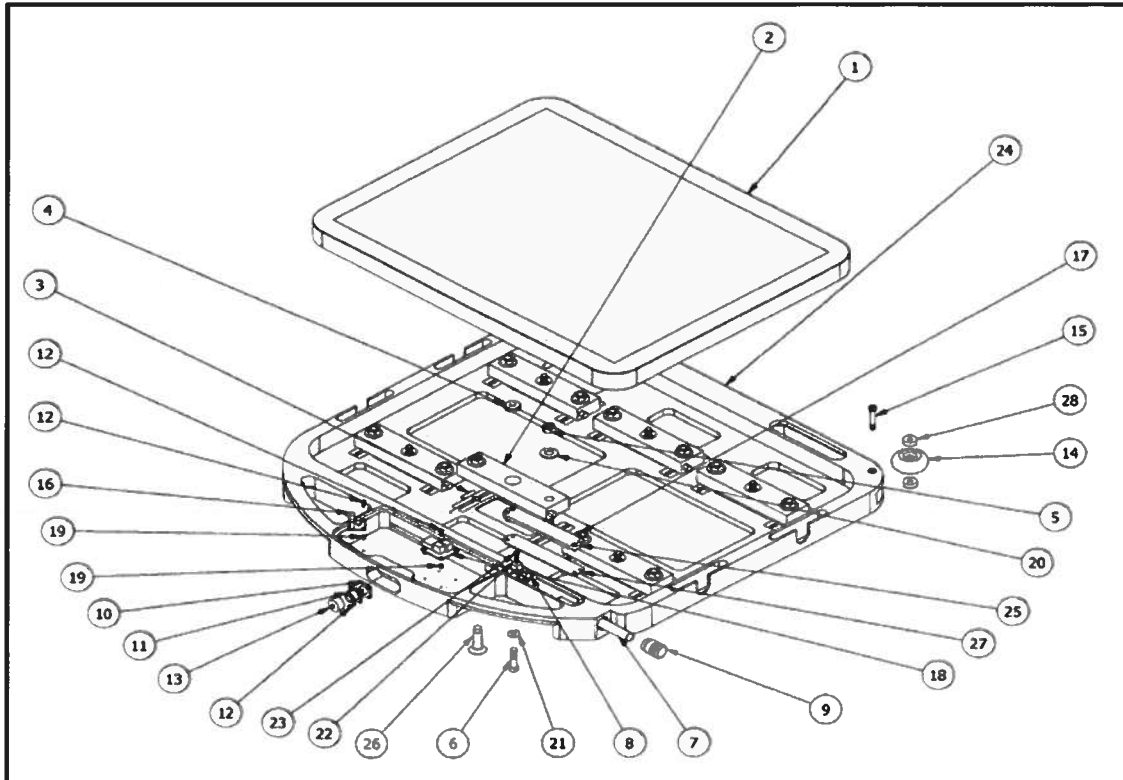
AC60-LP-IS SCALE ASSEMBLY



| INDEX | QTY | PART NUMBER | DESCRIPTION |
|-------|-----|-------------|--------------------------------------|
| 1 | 1 | 5201605 | REV B AC60-LP LOW PRO ASSEMBLY |
| 2 | 1 | 0200120 | REV A CIRCUITRY ASSEMBLY (60K SCALE) |
| 2 | 1 | 0200387 | REV A CIRCUITRY ASSEMBLY (70K SCALE) |
| 3 | 11 | 600040 | 6-32UNC X .625 SS PHIL PAN HD SCREW |
| 4 | 1 | 8030004 | REV A AC3060 BEZEL FRAME |

ILLUSTRATED PARTS BREAKDOWN

AC60-LP-IS SCALE ASSEMBLY EXPLODED VIEW



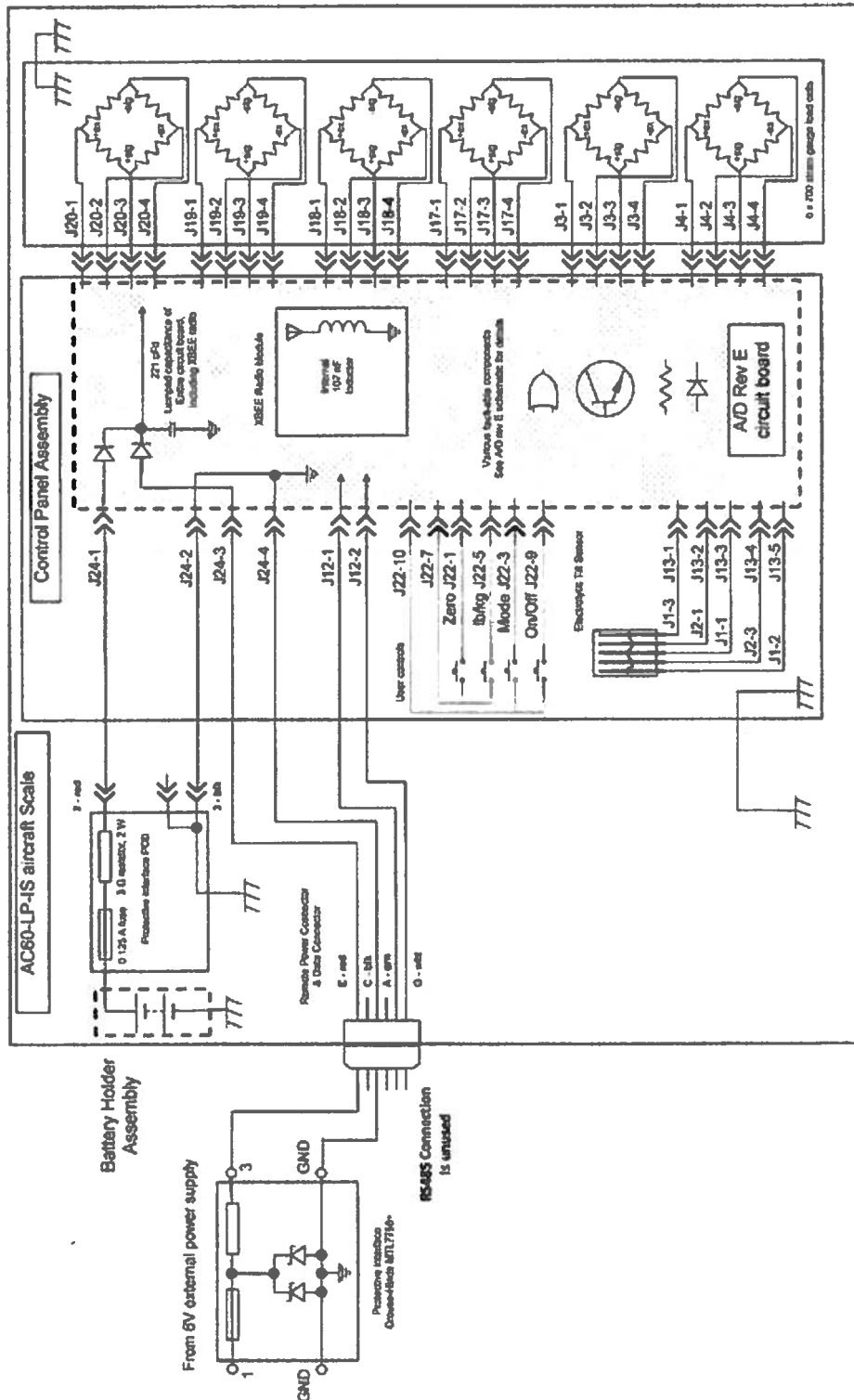
| INDEX | QTY | PART NUMBER | DESCRIPTION |
|-------|-----|-----------------|--------------------------------------|
| 1 | 1 | 5201597-4101013 | REV C AC60-LP PLATFORM |
| 2 | 6 | 6033232 | LOADCELL 15K |
| 3 | 24 | 604013 | .25 X 1.00 DOWEL PIN |
| 4 | 6 | 5201715 | REV A AC60-LP PLATFORM BEARING |
| 5 | 12 | 601072 | .500-13UNC JAM NUT |
| 6 | 6 | 602097 | 0.375-24UNF X 1.50 HEX HD BOLT GRD 8 |
| 7 | 1 | 503080 | REV A PT300 BATTERY TUBE (4 CELL) |
| 8 | 1 | 330025 | BATTERY HOLD AA METAL |
| 9 | 1 | 000425 | BATTERY CAP ASSEMBLY |
| 10 | 1 | 500027 | CONNECTOR GASKET 8 PIN |
| 11 | 1 | 0200139 | HARNESS ASSY_POWER-COM_AC60-LP-IS |
| 12 | 11 | 0200139 | 6-32UNC X 0.375 PHIL PAN HD SS |
| 13 | 1 | 220129 | 8 PIN DUST COVER |
| 14 | 2 | 6021069 | WHEEL WITH BEARING |

ILLUSTRATED PARTS BREAKDOWN

AC60-LP-IS Scale Exploded View (continued)

| INDEX | QTY | PART NUMBER | DESCRIPTION |
|-------|-----|-----------------|---|
| 15 | 2 | 6021082 | SHOULDER BOLT 0.313 DIA X 1.25 LONG |
| 16 | 1 | 000317-B | AC3060 TILT SENSOR |
| 17 | 4 | 490221 | SCREW 6-32 X .5 PHILIPS FLAT HEAD SS O-RING |
| 18 | 1 | 02000138 | PROTECTIVE INTERFACE BOARD ASSY |
| 19 | 7 | 601313 | 0.19 SPACER #6 SCREW |
| 20 | 12 | 6021084 | BELLEVILLE WASHER .531 ID 1.125 OD .062 THK |
| 21 | 6 | 6021078 | BELLEVILLE WASHER 0.380 ID 0.75 OD .062 THK |
| 22 | 1 | 503078 | REV B PT300 BATTERY STOP |
| 23 | 1 | 600214 | SCREW 8-32 X .75IN BLK PHIL PAN |
| 24 | 1 | 5201604-4101012 | REV E AC60-LP LOW PRO BASE |
| 25 | 1 | 5201716 | REV B BATTERY COVER |
| 26 | 12 | 5201945 | REV C AC60-LP LOADCELL BOLT |
| 27 | 1 | 5201946 | REV B AC60-LP BATTERY DOOR GASKET |
| 28 | 4 | 6021089 | BEARING FOR WHEEL (6021069) |

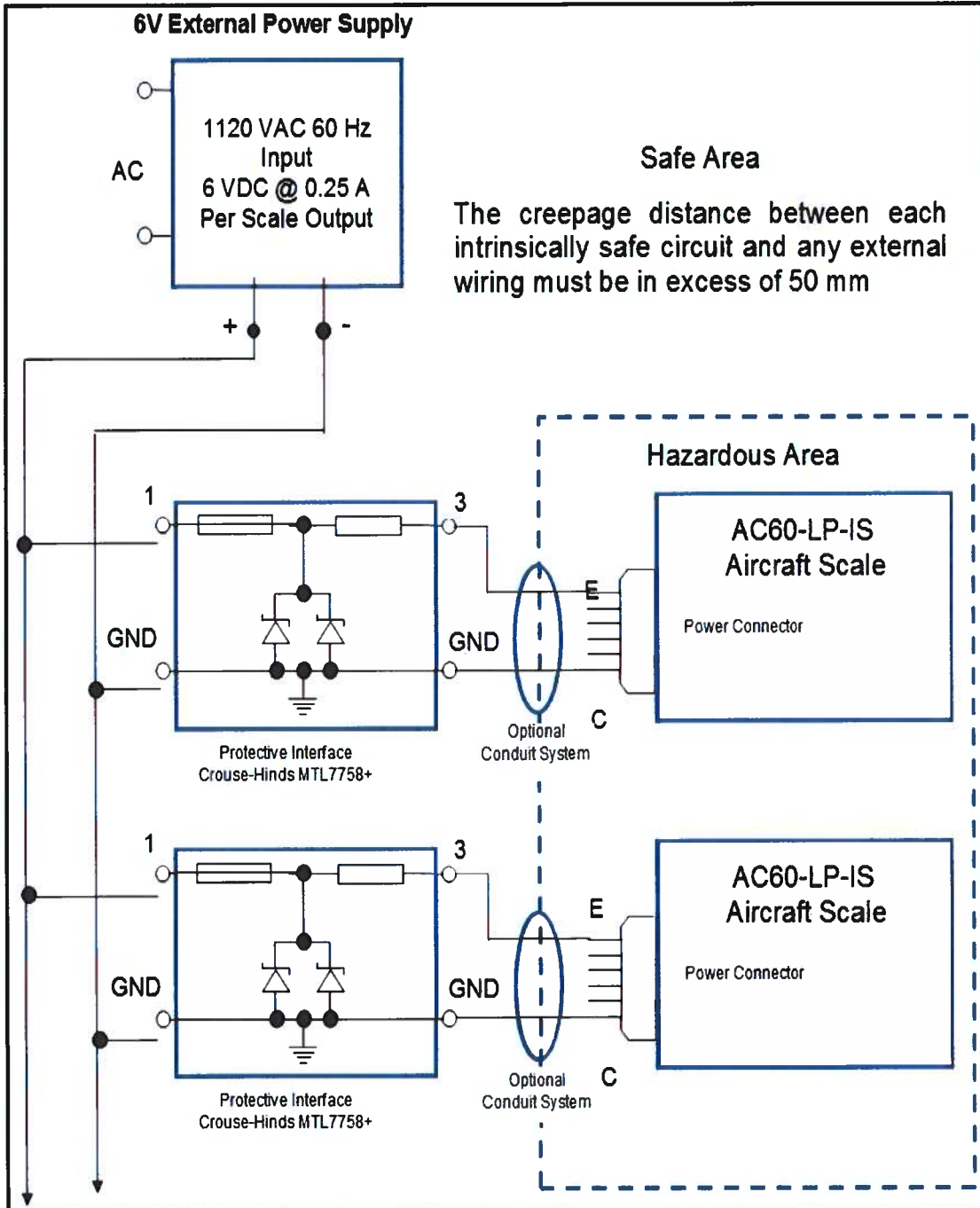
SYSTEM DIAGRAM



CONNECTION DIAGRAM

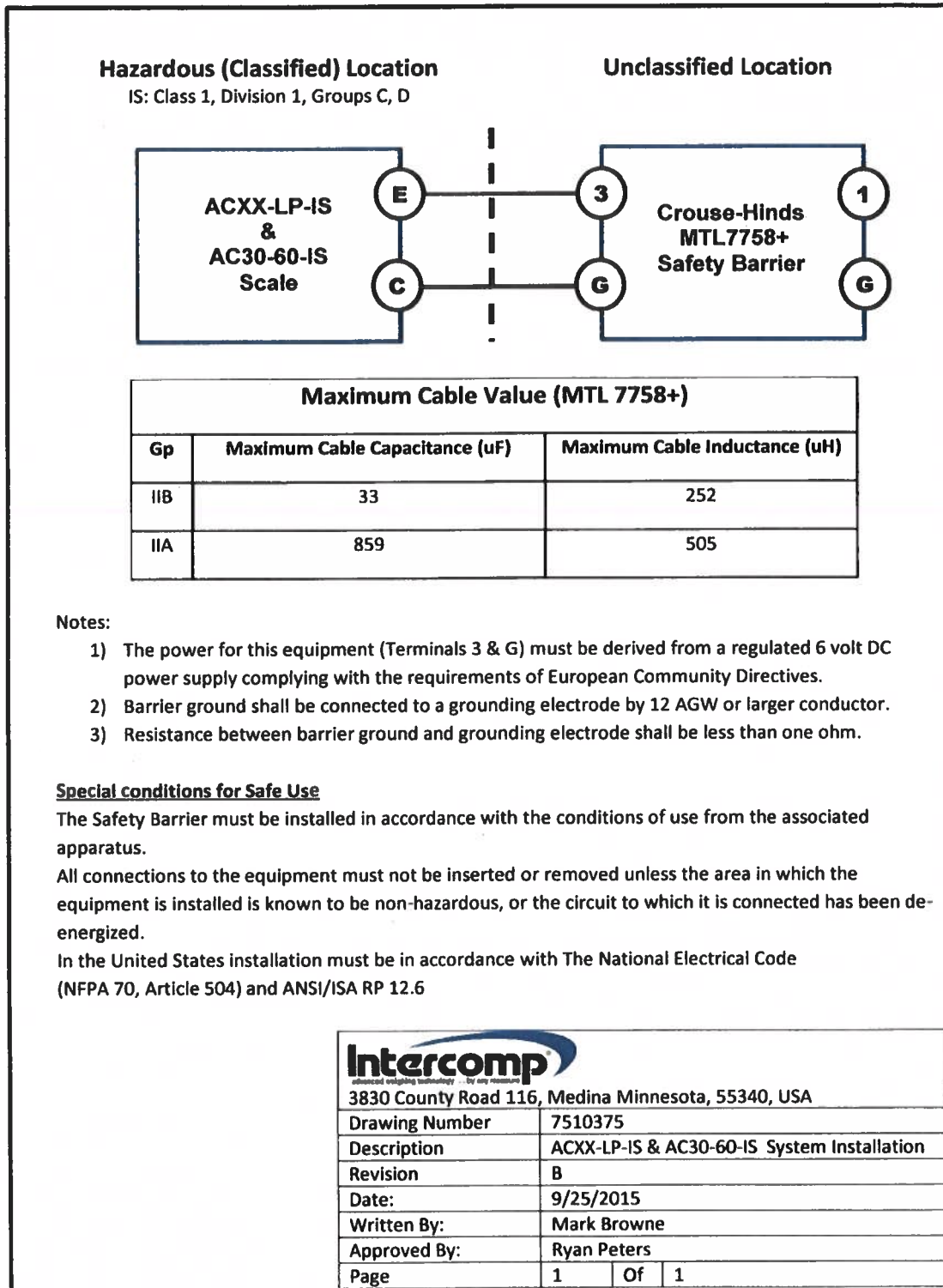


CAUTION: If the scale is powered from an external power supply, it must be connected through a protective interface as shown in the following diagram to maintain intrinsic safe protection.



To Additional Protective Interface / Scales

SYSTEM INSTALLATION DIAGRAM



EU DECLARATION OF CONFORMITY



PRODUCT DESCRIPTION: AC60-LP-IS Platform Scale

We, Intercomp Company
3839 County Road 116
Medina, Minnesota 55340 USA

Declare under the sole responsibility of Intercomp Company that the AC60-LP-IS Platform Scale to which this declaration relates is in conformity with the relevant Union harmonization legislation, and meets the essential health and safety requirements, and is in conformity with the relevant EC Directives listed below using the relevant section of the following standards and other normative documents.

| DIRECTIVE | DIRECTIVE TITLE / PURPOSE |
|---|---|
| (EC) No 278/2009 | No-load condition electric power consumption and average active efficiency of external power supplies |
| Directive 2009/125/EC | Ecodesign requirements for energy-related products (2005/32/EC recast) |
| Directive 2012/19/EU | On waste electrical and electronic equipment (WEEE) (Directive 20/96/EC Recast) |
| Directive 2013/56/EU (Amending Directive 2006/66/EC) | Sets out the limit of 0.0005% of mercury in batteries will also apply to button cell batteries from 1 st October 2015. The exemption of button cell batteries in hearing aids will be reviewed by 1 st October 2014. AKA batteries and accumulators directive |
| Directive 2014/30/EU Electromagnetic Compatibility (EMCD) Directive | Of the European Parliament and of the Council of 26 February 2014 on the harmonization of the laws of the Member States relating to electromagnetic compatibility (recast) Text with EEA relevance. The Directive covers apparatus sold as single functional units to end users, which are likely to 1) generate electromagnetic disturbance, or 2) have performance affected by electromagnetic disturbance. NOTE: If the unit has a radio (XBEE Radio Chip) installed, Directive 2014/53/EU will take precedence |
| Directive 2014/34U/EC | Of the European Parliament and of the Council of 26 February 2014 on the harmonization of the laws of the member States relating to equipment and protective systems intended for use in potentially explosive atmospheres (recast) Text with EEA relevance AKA ATEX Directive |
| Directive 2014/53/EU | Of the European Parliament and the Council of 16 April 2014 on the harmonization of the laws of member States making available on the market of radio equipment and repealing Directive 1999/5/EC Text with EEA relevance AKA Radio Equipment Directive (RED) |
| EN 300 328 V2.1.1 (2016-11) | Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band |

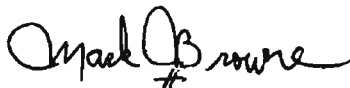
EU DECLARATION OF CONFORMITY

| DIRECTIVE | DIRECTIVE TITLE / PURPOSE |
|-------------------------------|---|
| EN 301 489-1 V2.2.0 (2017-03) | Electro-Magnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements |
| EN 45501:2015 | Metrological aspects of non-automatic weighing instruments |
| EN 55011:2016+A1:2017 | Industrial, scientific and medical equipment. Radio-frequency disturbance characteristics. Limits and methods of measurement |
| EN IEC 60079-0:2018 | Explosive atmospheres - Part 0: Equipment - General requirements |
| EN 60079-11:2012 | Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i" |
| EN 60079-25:2010/AC:2013 | Explosive atmospheres - Part 25: Intrinsically safe electrical systems |
| EN 60950-1:2006+A2:2013 | Information technology equipment. Safety. General requirements |
| EN 61000-6-1:2019 | Generic standards, Residential, commercial and light industry environment |
| EN 61000-6-2:2019 | Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments |
| EN 61000-6-3:2007+A1:2011 | Electromagnetic compatibility (EMC). Generic standards. Emission standard for residential, commercial and light-industrial environments |
| EN 62311:2008 | Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz) |

The safety issues of this measurement equipment have been evaluated under the self-certification provisions of the relevant directives. This product complies with all safety-relevant provisions referring to protection against electrical hazards and other hazards, such as mechanical hazards, fire hazards, noise and vibration.

The related technical construction files are held for inspection in the U.K. at Intercomp Europe Limited.

Signed for and on the behalf of Intercomp Company:



Mark Browne / Quality Manager
Medina, Minnesota USA
January 02, 2020

UK DECLARATION OF CONFORMITY

UK CA

PRODUCT DESCRIPTION: AC60-LP-IS Aircraft Weighing System

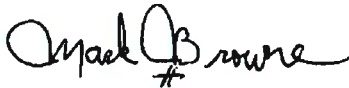
We, Intercomp Company
3839 County Road 116
Medina, Minnesota 55340 USA

Declare under the sole responsibility of Intercomp Company that the AC60-LP-IS Aircraft Weighing System to which this declaration relates is in with the relevant UK Statutory Instruments and their amendments listed below using the relevant section of the following standards and other normative documents.

The safety issues of this measurement equipment have been evaluated under the self-certification provisions of the relevant Statues. This product complies with all safety-relevant provisions referring to protection against electrical hazards and other hazards, such as mechanical hazards, fire hazards, noise and vibration.

The related technical construction files are held for inspection in the U.K. at Intercomp Europe Limited.

Signed for and on the behalf of Intercomp Company:



Mark Browne / Quality Manager
Medina, Minnesota USA
January 02, 2020

UK DECLARATION OF CONFORMITY

| STATUTORY INSTRUMENT OR STANDARD | TITLE / PURPOSE |
|--|--|
| Statutory Instruments 2016 No. 1107 | The Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations |
| EN IEC 60079-0:2018, | Explosive atmospheres -- Part 0: Equipment - General requirements |
| BS EN 60079-11:2012 | Explosive atmospheres -- Part 11: Equipment protection by intrinsic safety "i" |
| BS EN 60079-25:2010/AC:2013 | Explosive atmospheres - Part 25: Intrinsically safe electrical systems |
| Statutory Instruments 2016 No. 1091 | Electromagnetic compatibility |
| BS EN 61000-6-1:2007 | Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments |
| BS EN 61000-6-2:2005, BS EN 61000-6-2:2005/AC:2005 | Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments |
| Statutory Instruments 2017 No. 1206 | Radio Equipment Regulations |
| BS EN 300 328 V2.1.1 | Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques. |
| BS EN 300 328 V2.2.2 | Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz band; Harmonized Standard for access to radio spectrum |
| Statutory Instruments 2016 No. 1101 | The Electrical Equipment (Safety) Regulations |
| BS EN 62311:2008 | Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz) |
| Statutory Instruments 2009 No. 0890 as amended by Statutory Instruments 2015 No. 1935 | The Waste Batteries and Accumulators Regulations |
| Statutory Instruments 2016 No. | The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations |
| BS EN 50581:2012 | Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances |
| Statutory Instruments 2010 No. 2617 as amended by Statutory Instruments 2019 No. 0539 | The Ecodesign for Energy-Related Products and Energy Information (Amendment) (EU Exit) Regulations |
| BS EN 50563:2011, BS EN 50563:2011/A1:2013 | External a.c. - d.c. and a.c. - a.c. power supplies - Determination of no-load power and average efficiency of active modes |
| Statutory Instruments 2016 No. 1152 | Non-automatic Weighing Instruments Regulations |
| EN 45501:2015 | Metrological aspects of non-automatic weighing instruments |

HOW TO CONTACT INTERCOMP SERVICE

Please provide the following information when requesting service for the AC60-LP-IS Platform Scale.

1. Item Description and Part Number (if available)
2. Serial Number(s) of Item (if available)
3. When was item purchased (mm/yyyy)?
4. Where was item purchased (company/location)?

For Intercomp Service call or fax:

Main Office: 763-476-2531
Toll Free: 1-800-328-3336
Fax: 763-476-2613

Or complete the Service Support request form at:

www.intercompcompany.com

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AIRCRAFT WEIGHT AND BALANCE



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Medina, MN 55340 U.S.A.

www.intercompcompany.com

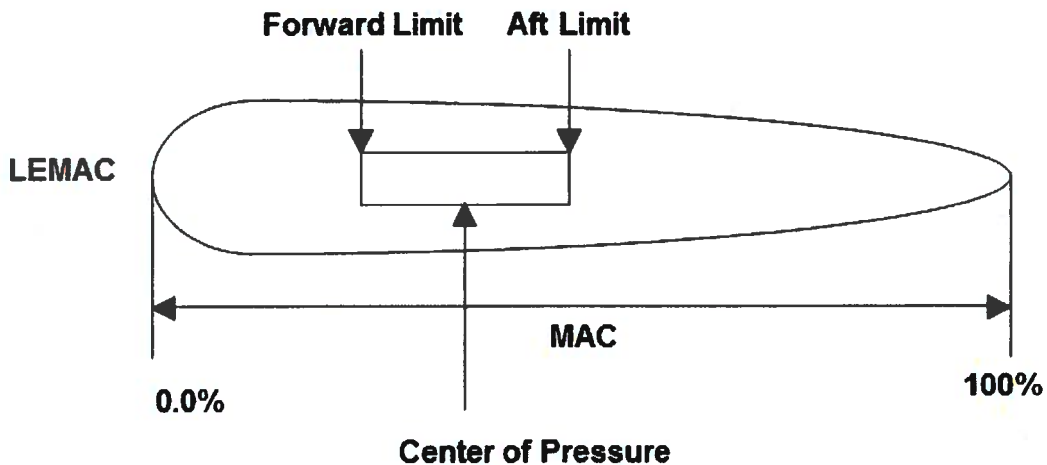
763-476-2531
1-800-328-3336
Fax: 763-476-2613

BASIC WEIGHT AND BALANCE THEORY

Weight and balance control consists of accounting for all the forces acting on an aircraft and verifying that these forces stay within fixed limits. In a maintenance setting, it is important to ensure that all weight and balance changes are accounted for, and that Service Weight Pickup is within acceptable limits.

FORCES ACTING ON AN AIRFRAME

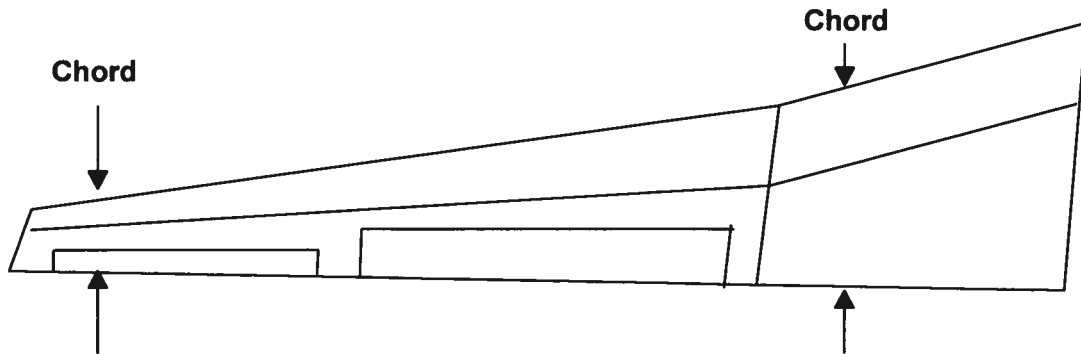
Air moving around the wing generates lift. The lift is generated over the entire wing. The net effect of the lift is concentrated on the Center Of Pressure. The horizontal stabilizer may modify the lift over a certain range. The Center of Pressure establishes limits on where the airplane may be loaded. The limits are referenced as the Aft Center of Gravity Limit, and the Forward Center of Gravity Limit.



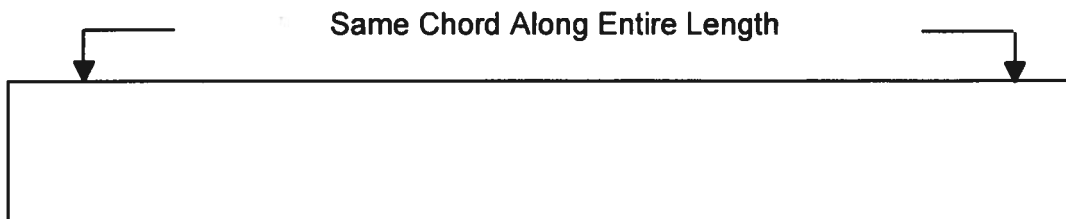
ATTENTION: MAC (Mean Aerodynamic Chord) and LEMAC (Leading Edge of Mean Aerodynamic Chord) references apply only to aircraft.

CHORD AND MEAN AERODYNAMIC CHORD

The wing is the center of lift in an airplane. Many important parameters of an airplane are specified in terms of the wing. A unit of measure used frequently is the Mean Aerodynamic Chord. A chord is an imaginary line from the leading edge to the trailing edge. The Mean Aerodynamic Chord location can vary among aircraft from one end of the wing to the other.



Where is the center of lift of the wing shown above? The mean aerodynamic chord is the average chord of the entire wing. For weight and balance purposes the wing may be replaced with a wing as shown in the following diagram.



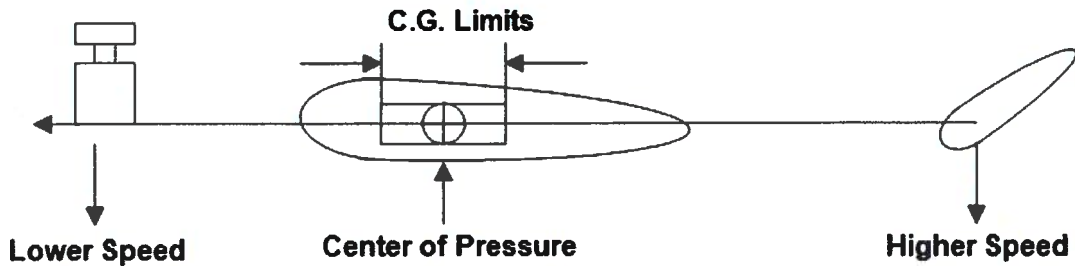
The airframe has a specific weight that may be idealized as a single replacement weight at a point known as the Center of Gravity. The equivalent weight must fall in the range set by the center of gravity limits referenced above.

LONGITUDINAL DYNAMICS

The wing is combined with the mass of the airframe and the horizontal stabilizer to form a stable flying platform. There are three Longitudinal Dynamics configurations: the Classic Configuration, Flying Stabilizer Configuration and Canard Configuration.

CLASSIC CONFIGURATION

The Classic Configuration finds the aircraft weighted lightly forward of the center of pressure with the tail inclined slightly downward. As the aircraft moves forward the tail reacts to the airstream flowing over it. At a certain point, there is as much pressure pushing the tail downward as there is weight in the nose resulting in a system that is stable. If the airplane slows down, the tail does not exert as much pressure and the nose drops. The plane picks up speed until the tail counterbalances the weight in the nose. If the plane has too much speed, the tail presses down, picking up the nose and slowing the plane. The angle of the stabilizer may be adjusted which changes the angle of attack of the wing generating subsequent lift.

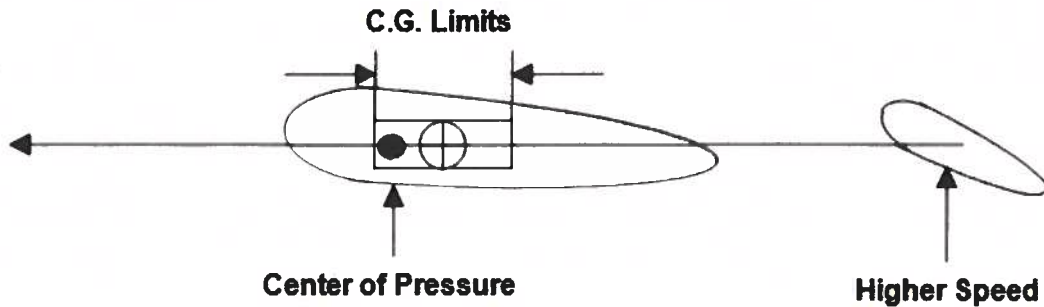


CLASSIC CONFIGURATION

LONGITUDINAL DYNAMICS

FLYING STABILIZER CONFIGURATION

The Flying Stabilizer Configuration is a variation of the classic system. The classic system has the stabilizer pushing down, reducing the potential lift of the wing. In high performance aircraft, the horizontal stabilizer can also be a lifting surface. The center of pressure is located between the main wing and the stabilizer. A computer monitors the attitude of the aircraft and adjusts the stabilizer many times a second. This type of system depends on the computer for maintaining stability. While the Flying Stabilizer is generally a more complex configuration, the result is greater lift for the same amount of wing and tail.

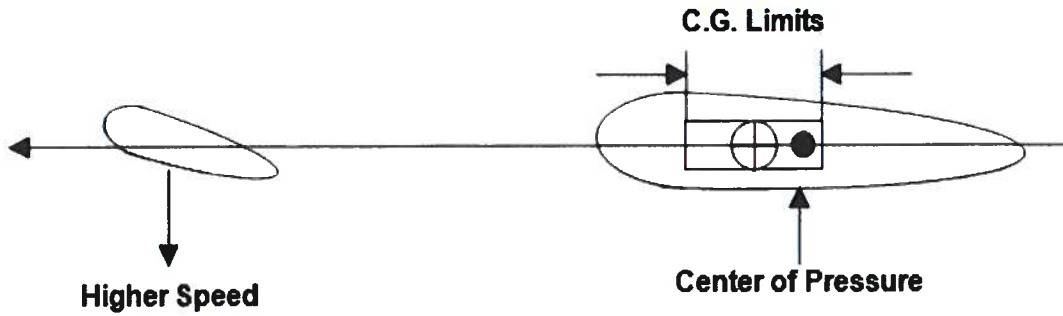


FLYING STABILIZER CONFIGURATION

LONGITUDINAL DYNAMICS

CANARD CONFIGURATION

The third system is the Canard Configuration. The horizontal stabilizer is positioned forward of the wing and functions as a lifting surface. As the plane picks up speed, the stabilizer lifts the nose and slows the aircraft. If the nose drops, the plane picks up speed and restores the nose. The stabilizer is designed to stall before the main wing, so there is a limit on how far the nose can be forced up with this system. This can be a desirable trait, as it makes the aircraft more forgiving by making it difficult to stall the main wing.



CANARD CONFIGURATION

LONGITUDINAL DYNAMICS

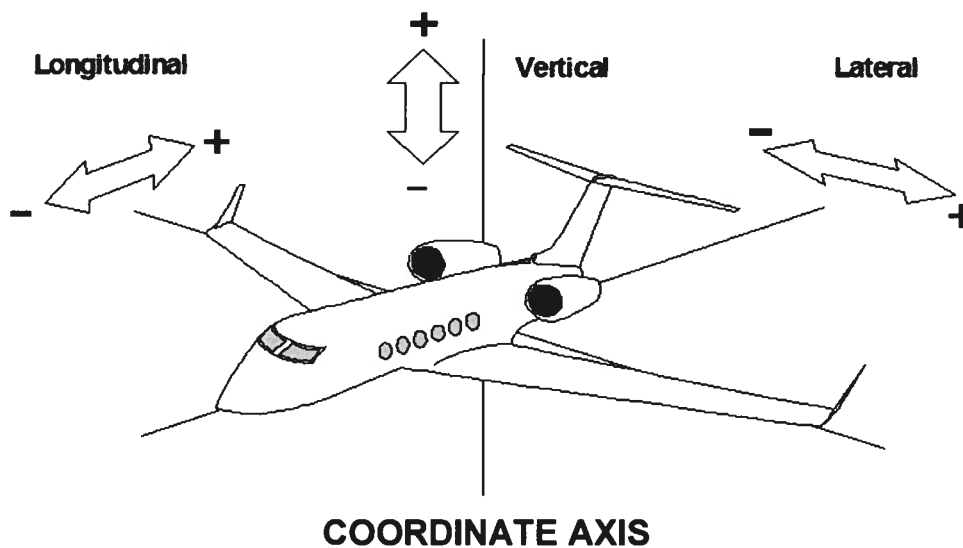
COORDINATE AXIS

There are three primary forces impacting an aircraft; up-down, left-right and front back. These forces are also used by the following conventional designations.

| CLASSIFICATION | FORCE |
|----------------|--------------|
| VERTICAL | UP - DOWN |
| LATERAL | LEFT - RIGHT |
| LONGITUDINAL | FRONT - BACK |

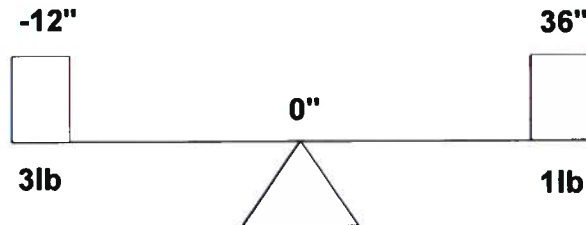
SAWE RP-6A recommends the Right Hand Rule be followed, with the positive direction to the right. ANSI/AIAA R-004-1990 and MIL-A-8591G are also good resources. Another popular convention is to use the side that the pilot sits on as the positive axis. For fixed wing aircraft the positive axis is on the left side as shown in the following diagram. When discussing rotary wing aircraft, the positive axis is the right side.

In different situations, the sign of any axis may be different than what is referenced in the illustration. As long as the designation used is applied consistently during any calculations, and prominently noted on the weight report, the actual designation used will not have an adverse effect on the correct calculation of the CG values.



INTRODUCTION TO LEVERS, ARMS, MOMENTS

The wing can be thought of as a fulcrum in a lever system. All forces must balance at the fulcrum (wing) for the airplane to be stable. The following diagram is an example of a simple lever system.



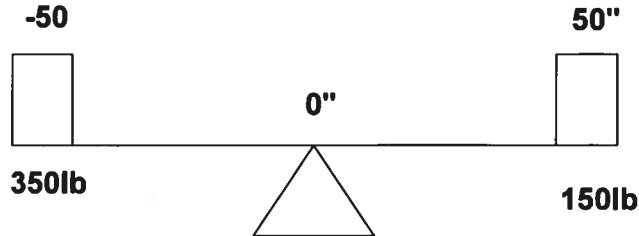
A three-pound weight is placed twelve inches to the left of the fulcrum, and a one-pound weight is placed 36 inches to the right of the fulcrum. Each weight is a specific distance from the fulcrum. This distance is known as the ARM. The ARM is combined with the weight to create a MOMENT.

A Moment is a measure of the rotational tendency of a weight about a point. A Moment is calculated by multiplying the weight of an object by the ARM. Calculate the moment for both weights. The left weight is 3 Lbs times -12 inches for -36 inch-pounds. Note that distances to the left of the fulcrum are given as minus values. The moment for the right hand weight is 36-inches times 1 pound for 36 inch-pounds. This system is in equilibrium. The forces on both sides of the fulcrum are in balance. Refer to the following statement:

Equilibrium is achieved when the sum of moments about the fulcrum equals zero. ($M1 + M2 = 0$)

INTRODUCTION TO LEVERS, ARMS, MOMENTS

Examine the following lever system.



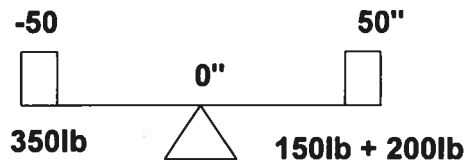
The system is not in balance and can be verified by calculating and comparing the moments.

$$\begin{aligned}
 350 \text{ lb} \cdot -50 \text{ in} &\neq 150 \text{ lb} \cdot 50 \text{ in} \\
 (-17500) \text{ in-lb} &\neq 7500 \text{ in-lb}
 \end{aligned}$$

How can the system be brought into balance? The condition of balance may be affected by changing the weight(s), the position of the weights, or the position of the fulcrum.

Review the following examples.

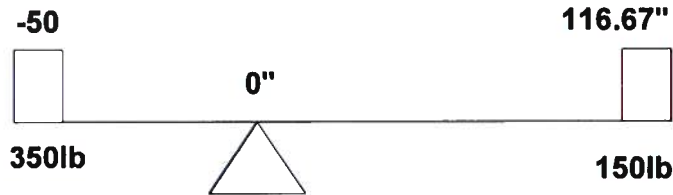
ADDING WEIGHT



$$\begin{aligned}
 350 \text{ lb} \cdot -50 \text{ in} &= (150 \text{ lb} + 200 \text{ lb}) \cdot 50 \text{ in} \\
 (-17500) \text{ in-lb} &= 17500 \text{ in-lb}
 \end{aligned}$$

INTRODUCTION TO LEVERS, ARMS, MOMENTS

MOVING WEIGHT

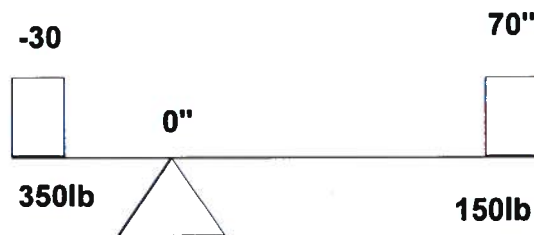


$$350 \text{ lb} \cdot -50 \text{ in} = 150 \text{ lb} \cdot 116.67 \text{ in}$$

$$(-17500) \text{ in-lb} = 17500.5 \text{ in-lb}$$

Note the slight error caused by a repeating decimal on the 116.66 . . . number. The number can be extended to as many places as required to obtain the desired accuracy.

MOVE THE BEAM ON FULCRUM



$$350 \text{ lb} \cdot -30 \text{ in} = 150 \text{ lb} \cdot 70 \text{ in}$$

$$(-10500 \text{ in-lb}) = 10500 \text{ in-lb}$$

To summarize the results of the preceding examples, it can be more convenient to represent the position of the weight and corresponding value as a composite value of the MOMENT ARM or the MOMENT. Restated, this is the weight times the distance from a reference. In each of the preceding examples, the bottom line calculation compares two Moment ARMs. A Moment ARM can be used to describe any weight on an airframe.

INTRODUCTION TO LEVERS, ARMS, MOMENTS

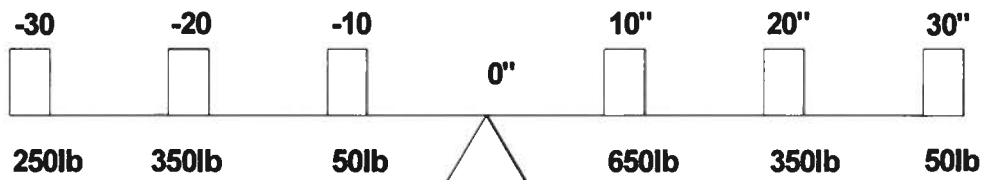
Refer to the previous example ADDING WEIGHT.

Calculate the moments for each weight.

$$\begin{array}{rcl}
 150 \text{ lb} \cdot 50 \text{ in} & = & 7500 \text{ in-lb} \\
 + 200 \text{ lb} \cdot 50 \text{ in} & = & + 10000 \text{ in-lb} \\
 \hline
 350 \text{ lb} \cdot 50 \text{ in} & = & 17500 \text{ in-lb}
 \end{array}$$

It is important to note that moments can be added together. In general, any number of moments may be added to calculate the total effect

EXAMPLE

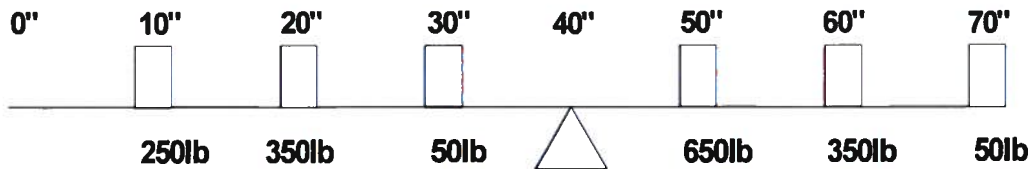


$$\begin{array}{rcl}
 250 \text{ lb} \cdot -30'' & = & -7500 \text{ in-lb} & & 650 \text{ lb} \cdot 10'' & = & 6500 \text{ in-lb} \\
 350 \text{ lb} \cdot -20'' & = & -7000 \text{ in-lb} & & 350 \text{ lb} \cdot 20'' & = & 7000 \text{ in-lb} \\
 50 \text{ lb} \cdot -10'' & = & -500 \text{ in-lb} & & 50 \text{ lb} \cdot 30'' & = & 1500 \text{ in-lb} \\
 \hline
 (-15000) \text{ in-lb} & = & & & 15000 \text{ in-lb} & &
 \end{array}$$

There is no set requirement for the fulcrum to be the zero location. Any point can be selected as long as the point is used for all calculations. Doing so provides a bonus as all signs of numbers are the same, making it less likely to introduce a math error.

INTRODUCTION TO LEVERS, ARMS, MOMENTS

Recalculate the preceding example using the reference positioned 10 inches to the left of the weight farthest to the left. In addition, calculate the total moment for all the weights and compare the result to the fulcrum.



| | | | | |
|----------------|--------------|----------|--------------|--------------|
| 250 lb | • 10" | = | 2500 | in-lb |
| 350 lb | • 20" | = | 7000 | in-lb |
| 50 lb | • 30" | = | 1500 | in-lb |
| 650 lb | • 50" | = | 32500 | in-lb |
| 350 lb | • 60" | = | 21000 | in-lb |
| 50 lb | • 70" | = | 3500 | in-lb |
| 1700 lb | | | 68000 | in-lb |

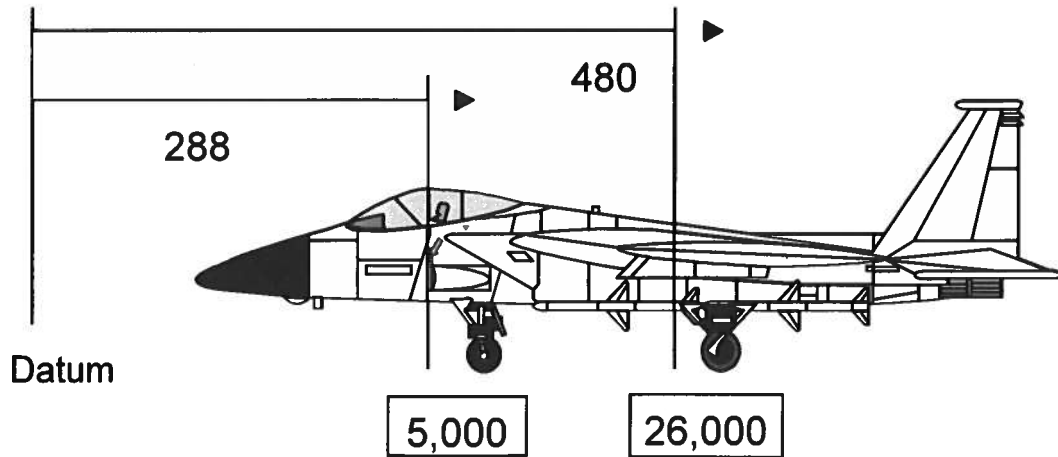
To find the center of gravity, divide the total moment by the total weight.

$$\frac{68000 \text{ in-lb}}{1700 \text{ lb}} = 40.0" \text{ C.G.}$$

The center of gravity is at the same point as the fulcrum. The system is in equilibrium.

INTRODUCTION TO LEVERS, ARMS, MOMENTS

The following diagram provides an example of levers and moments applicable to an actual aircraft: The scale will incorporate inclinometers, altitude and latitude correction.



Find Total Weight

$$\begin{array}{r} 5,000 \\ + 26,000 \\ \hline 31,000 \text{ Total Weight} \end{array}$$

Find Total Moment

$$\begin{array}{r} 480 \text{ in} \times 26,000 \text{ lb} = 12,480,000 \text{ in-lb} \\ + 288 \text{ in} \times 5,000 \text{ lb} = 1,440,000 \text{ in-lb} \\ \hline 13,920,000 \text{ in-lb Total Moment} \end{array}$$

Find Center of Gravity

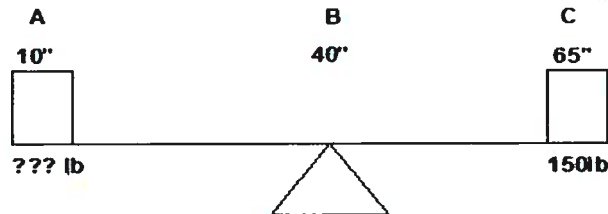
$$\frac{13,920,000 \text{ in-lb}}{31,000 \text{ lb}} = 449 \text{ in Center of Gravity}$$

INTRODUCTION TO LEVERS, ARMS, MOMENTS

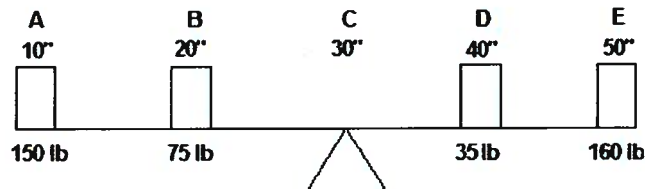
SAMPLE PROBLEMS

Problem 1

How much weight has to be added to position A to obtain a state of equilibrium?



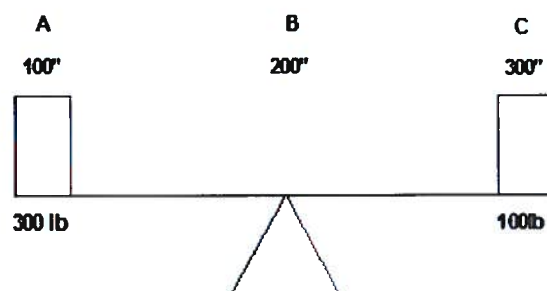
Problem 2



1. Where is the balance point using the values referenced?
2. How much weight must be moved between positions A and E to obtain equilibrium?
3. How much weight must be moved between positions A and D to obtain equilibrium?
4. How much weight must be moved between positions D and E to obtain equilibrium?
5. How much weight must be moved between positions A and B to obtain equilibrium?
6. How much weight must be moved between positions B and C to obtain equilibrium?

Problem 3

How does adding 100 pounds at position B affect the Center of Gravity?



INTRODUCTION TO LEVERS, ARMS, MOMENTS

SUMMARY

1. Weight added forward of the CG will move the CG forward.
2. Weight added aft of the CG will move the CG aft.
3. Weight added to the existing CG will have little or no effect on the CG.
4. Weight removed forward of the CG will move the CG aft.
5. Weight removed aft of the CG will move the CG forward.
6. Weight removed at the existing CG will have little or no effect on the CG.

Alternatively, if weight is added forward of, or removed aft of, the existing CG, the CG will move forward. If the new CG is too far forward of the center of lift, a nose-heavy condition may result. Conversely, if the weight is added aft, or removed forward, of the existing CG, the CG will move aft. If it is too far aft of the center of lift a tail-heavy condition will result.

FUEL DENSITY AND TEMPERATURE

Information referenced in Fuel Weight and Moment tables is based on an average fuel density at fuel temperatures of 60°F. However, fuel weight increases about 0.1 lb/gal for each 25°F decrease in fuel temperature.

| FUEL | WEIGHT |
|----------|-----------------------|
| GASOLINE | 6.0 pounds per gallon |
| JP-4 | 6.5 pounds per gallon |
| JP-5 | 6.8 pounds per gallon |
| JP-8 | 6.8 pounds per gallon |

Whenever fuel temperatures are different than the temperatures referenced in the chart headings, a new fuel weight calculation should be made using the 0.1 lb/gal increase in fuel weight for each 25°F decrease in fuel temperature.

EXAMPLE

Consider 500 gallons of JP-4 at 32°F.

At 60°F the weight of the JP-4 would be 3250 pounds.

Calculate revised weight:

$$500 \cdot (6.5 + (0.1 \cdot (60-32)/25)) =$$

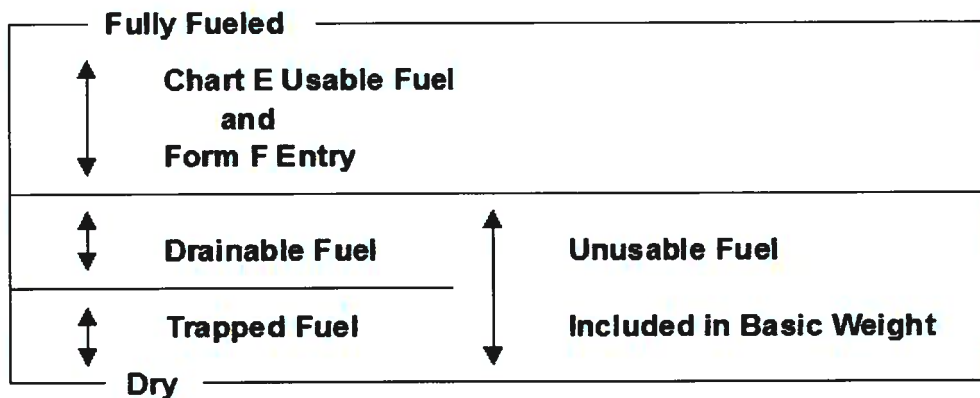
$$500 \cdot (6.5 + (0.1 \cdot 1.12)) =$$

$$500 \cdot (6.5 + 0.112) =$$

$$500 \cdot 6.612 = 3306 \text{ pounds (A 1.7 \% change)}$$

The average density of the fuel referenced in the following diagram

FUEL DENSITY



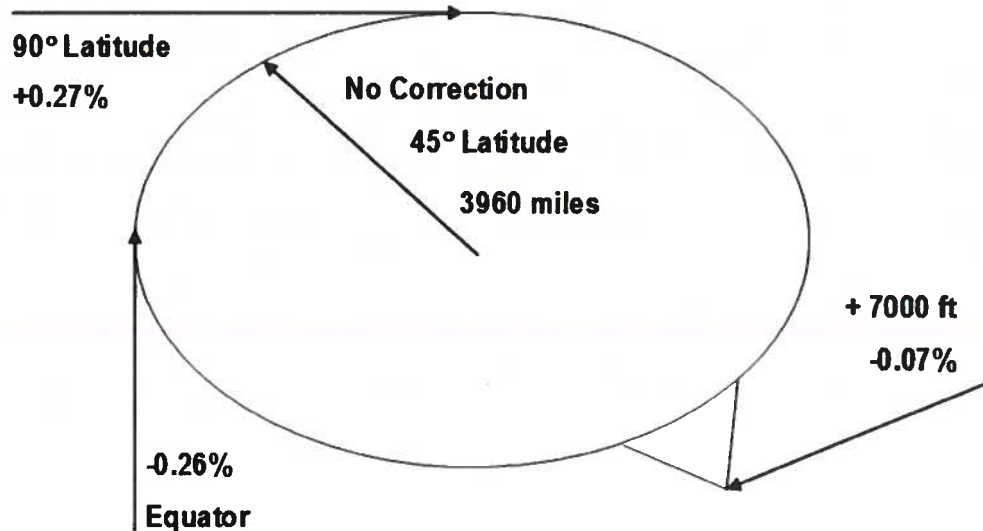
LATITUDE CORRECTION

Latitude Correction is required when a scale is calibrated with weights at one location and then transported to a different location. If a scale is calibrated with weights at a given location, the effects highlighted in the following diagram are corrected in the calibration process.



ATTENTION: When using a force style calibration press, the calibration will be equivalent to conducting a calibration at latitude of 45°. Latitude correction is not required.

VARIATIONS IN THE ATTRACTION OF GRAVITY



The force of attraction of the earth on any object is influenced by latitude and altitude.

The formula that describes the attraction of gravity ($F=G \cdot M_1 \cdot M_2 / R^2$) reveals that the further an object is from the center of the earth, the less the effect the earth has on the object. The earth bulges at the equator and flattens at the poles, the result of centrifugal force exerted by the rotation of the earth.

According to the World Geodetic System (WGS) 1984 survey, the bulge at the equator extends approximately 13 miles (21 km) from the equator to the poles. By convention, sea level when calculated at latitude of 45° is accepted as the standard reference point for measuring mass. Using the standard reference point as a guide, objects weighed at the equator will weigh less than the standard reference point. Objects weighed at the poles will weigh more than the standard reference point.

In general, an object weighs the most at sea level at the poles, and the least at the equator and to a lesser amount at higher altitudes. The effect is small, approximately 0.25%, but it must be factored into the equation to achieve accurate weighing.

LATITUDE CORRECTION

LATITUDE CORRECTION TABLE

The following table references the correction factors for different latitudes and altitudes. To use the table, multiply the weight displayed on the scale by the desired table entry. The result will be the corrected weight at standard conditions (sea level at 45° latitude).

| LAT | ALTITUDE ABOVE SEA LEVEL (FT) | | | | | | | | ACCEL OF GRAVITY |
|-----|-------------------------------|--------|--------|--------|--------|--------|--------|--------|------------------|
| | 0 | 1000 | 2000 | 3000 | 4000 | 5000 | 6000 | 7000 | |
| 0 | 1.0027 | 1.0028 | 1.0029 | 1.0030 | 1.0031 | 1.0032 | 1.0033 | 1.0034 | 32.0878 |
| 5 | 1.0026 | 1.0027 | 1.0028 | 1.0029 | 1.0030 | 1.0031 | 1.0032 | 1.0033 | 32.0891 |
| 10 | 1.0025 | 1.0026 | 1.0027 | 1.0028 | 1.0029 | 1.0030 | 1.0031 | 1.0032 | 32.0929 |
| 15 | 1.0023 | 1.0024 | 1.0025 | 1.0026 | 1.0027 | 1.0028 | 1.0029 | 1.0030 | 32.0991 |
| 20 | 1.0021 | 1.0022 | 1.0023 | 1.0024 | 1.0025 | 1.0025 | 1.0026 | 1.0027 | 32.1076 |
| 25 | 1.0017 | 1.0018 | 1.0019 | 1.0020 | 1.0021 | 1.0022 | 1.0023 | 1.0024 | 32.1180 |
| 30 | 1.0014 | 1.0015 | 1.0016 | 1.0017 | 1.0017 | 1.0018 | 1.0019 | 1.0020 | 32.1302 |
| 35 | 1.0009 | 1.0010 | 1.0011 | 1.0012 | 1.0013 | 1.0014 | 1.0015 | 1.0016 | 32.1435 |
| 40 | 1.0005 | 1.0006 | 1.0007 | 1.0008 | 1.0009 | 1.0010 | 1.0011 | 1.0012 | 32.1578 |
| 45 | 1.0000 | 1.0001 | 1.0002 | 1.0003 | 1.0004 | 1.0005 | 1.0006 | 1.0007 | 32.1725 |
| 50 | 0.9996 | 0.9997 | 0.9998 | 0.9999 | 1.0000 | 1.0001 | 1.0002 | 1.0003 | 32.1873 |
| 55 | 0.9991 | 0.9992 | 0.9993 | 0.9994 | 0.9995 | 0.9996 | 0.9997 | 0.9998 | 32.2016 |
| 60 | 0.9987 | 0.9988 | 0.9989 | 0.9990 | 0.9991 | 0.9992 | 0.9993 | 0.9994 | 32.2151 |
| 65 | 0.9983 | 0.9984 | 0.9985 | 0.9986 | 0.9987 | 0.9988 | 0.9989 | 0.9990 | 32.2272 |
| 70 | 0.9980 | 0.9981 | 0.9982 | 0.9983 | 0.9984 | 0.9985 | 0.9986 | 0.9987 | 32.2377 |
| 75 | 0.9978 | 0.9979 | 0.9979 | 0.9980 | 0.9981 | 0.9982 | 0.9983 | 0.9984 | 32.2463 |
| 80 | 0.9976 | 0.9977 | 0.9978 | 0.9979 | 0.9979 | 0.9980 | 0.9981 | 0.9982 | 32.2525 |
| 85 | 0.9974 | 0.9975 | 0.9976 | 0.9977 | 0.9978 | 0.9979 | 0.9980 | 0.9981 | 32.2564 |
| 90 | 0.9974 | 0.9975 | 0.9976 | 0.9977 | 0.9978 | 0.9979 | 0.9980 | 0.9981 | 32.2577 |

Example: An aircraft is weighed in a hangar at 10° latitude at an altitude of 1000 Ft. The scales were calibrated using a force style press, requiring the indicated weight to be corrected.

$$15000 \text{ lb} \cdot 1.0026 = 15039 \text{ lb}$$

If the scale has an altitude / latitude correction feature, the data set forth in the table will be applied automatically. Enter the latitude and altitude and the scale will calculate the correction.

LEVELING CONSIDERATIONS

The manual references the influences that level floors have on weighing an aircraft. The true level of the floor can affect the weight calculation of the aircraft.

The force delivered to the scales is the same regardless of the floor condition. However, the weight displayed by the scale is amount detected going in a direction perpendicular to the plane formed by the top of the scale. A scale should disregard any sideway component of the force imparted by the object being weighed. Ignoring the sideway force component reduces errors caused by the sideways flexing of rubber tires or the misalignment of the wheels. When a scale is not level, the force exerted by the scale is split into two components: 1) a vertical force (weight) and 2) horizontal force. Any part of the force that is put into the horizontal component is not recognized as weight. This has the effect of reducing the sensed weight. The force remaining to be sensed as weight is the weight times the cosine of the angle of the scale.

Example: A 10000-pound weight is positioned on a scale sitting on a 3° slope.

$$10000 \text{ lb} \cdot \cos. 3^\circ = 10000 \cdot 0.99863 = 9986.3 \text{ lb}$$

The resulting calculation is an error of 0.14%. An error of 0.14% is greater than the entire error allowed by the scale. To reduce the errors to a negligible level, the scales should be on a level surface with an angle better than 1.2°.

Repeat the preceding example using a 1.2° angle:

$$10000 \text{ lb} \cdot \cos. 1.2^\circ = 10000 \cdot 0.99978 = 9997.8 \text{ lb}$$

The result is an error of 0.02%

If the angle of the floor where the plane is being weighed is known, a correction factor can be applied.

$$\text{Corrected Weight} = \text{Weight} + \text{Weight} \cdot (1 - \cos. \text{Angle})$$

Some scales automatically sense the angle of the floor, then calculate and apply the required correction factor.

REFERENCE FORMULAS

The reference datum of an aircraft is typically a point on or in front of the nose. During static flight, the fulcrum is the center of pressure, as defined by the manufacturer of the aircraft. This may be specified in units of MAC of the aircraft. Examples of listed weights are engines, installed equipment, cargo, passengers and fuel.

The moment to be added or subtracted from the basic moment is calculated by multiplying the weight of the object by its ARM or distance from the reference datum. From the calculation, three formulas can be derived.

$$\text{Weight (Pounds)} \times \text{ARM (Inches)} = \text{Moment (Inch Pounds)}$$

$$\text{Moment (Inch Pounds)} / \text{Weight (Pounds)} = \text{ARM (Inches)}$$

$$\text{Moment (Inch Pounds)} / \text{ARM (Inches)} = \text{Weight (Pounds)}$$

Total moment is the sum of the basic moment of the aircraft and the moment(s) of the item(s) being loaded. Total weight is the sum of the aircraft's basic weight and the total weight of the load items. When total moment is divided by total weight the result is the composite CG position in inches (or meters) from the longitudinal reference datum. The result of the calculation provides the following information:

COMPUTE CENTER OF GRAVITY

$$\text{Average Arm (CG)} = \frac{\text{Total Moment}}{\text{Total Weight}}$$

COMPUTE PERCENT MAC

$$\% \text{ MAC} = \frac{\text{Longitudinal CG} - \text{Leading Edge of MAC}}{\text{MAC}} \bullet 100$$

The following group of formulas is used to calculate CG location when adding, subtracting or moving weights.

Adding Weight

$$\text{New CG} = \frac{\text{Old Moment} + \text{Added Moment}}{\text{Old Weight} + \text{Added Weight}}$$

Removing Weight

$$\text{New CG} = \frac{\text{Old Moment} - \text{Removed Moment}}{\text{Old Weight} - \text{Removed Weight}}$$

Moving Weight

$$\text{New CG} = \frac{\text{Old Moment} + \text{Moved Moment}}{\text{Total Weight}}$$

CG Change

$$\text{CG Change} = \frac{\text{Change in Moment}}{\text{Total Weight}}$$

REFERENCE FORMULAS

WEIGHT DEFINITIONS REVEALED

WEIGHT EMPTY

+

Unusable fuel, Oil, Ballast, Survival kits, oxygen or any other equipment not disposed of during the flight and not listed in Chart E.

-

Any Chart A type items that are missing from the aircraft.

=

BASIC WEIGHT

+

Crew, crew baggage, steward equipment, emergency equipment, special mission fixed equipment, and all other non-expendable items not in basic weight.

=

OPERATING WEIGHT

+

USABLE FUEL

+

Payload items such as cargo, passengers, stores and disposable fuel tanks.

=

TAKEOFF GROSS WEIGHT

-

Load items expended in flight such as fuel, stores, ammunition, cargo and paratroops.

=

LANDING GROSS WEIGHT



AIRCRAFT TERMS AND DEFINITIONS

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A

AFT CENTER OF GRAVITY - The aft-most permissible aircraft center-of-gravity location for a specific weight condition.

AIRCRAFT WEIGHING RECORD - The form used to record data obtained from actual aircraft weighing.

ALL-UP WEIGHT - See Gross Weight.

ALLOWABLE GROSS WEIGHT (AGW) – AGW is the Not to Be Exceeded Weight of a loaded aircraft. The Aircraft Flight Manuals specify allowable weights that must not be exceeded for a particular configuration or specific mission. Some examples are: Allowable takeoff weight, Allowable landing weight and Allowable jacking weight.

ARM (A) - A measurement of distance, in inches, feet, etc. used in weight and balance calculations. Normally only the longitudinal arm is of practical importance. The three axial arms are:

LONGITUDINAL ARM - The distance, parallel to the longitudinal axis, between the center of gravity of a load item and the reference plane for longitudinal load arms. By convention, the longitudinal arm is negative (-) when forward, positive (+) when aft, of the designated fuselage station reference datum.

LATERAL ARM - The distance parallel to the lateral axis between the center of gravity of a load item and the reference plane for lateral load arms. A popular convention is to take the side that the pilot sits on as the positive (+) axis. For fixed wing aircraft this is the left side as shown, for rotary wing aircraft, this is the right side. SAWE RP-6A recommends the Right Hand Rule be followed, with the positive direction to the right. See also: ANSI/AIAA R-004-1990 and MIL-A-8591G.

VERTICAL ARM - The distance parallel to the vertical axis between the center of gravity of a load item and the reference plane for vertical load arms. By convention, the vertical arm is positive (+) when above and negative (-) when below the designated waterline reference datum.

AVERAGE ARM - Refer to Balance Arm.

B

BALANCE - The condition of stability that exists in an aircraft when all weights and forces are acting in such a way as to prevent rotation about an axis or pivot point.

BALANCE ARM - The arm, or distance from a reference datum. The Balance Arm is the result of dividing the total moment by the total weight.

BALANCE STATION - A point measured in inches from the horizontal reference datum. Balance Station 0.0 is the reference datum.

BALLAST - Any weight installed in the aircraft for balancing the aircraft so that it remains within permissible center of gravity limits. Ballast installation may be temporary, permanent, or any combination of it.

BASIC ARM - That distance from the reference datum to the aircraft Basic Weight Center of Gravity. The basic arm is determined by dividing the aircraft basic moment by the aircraft basic weight.

BASIC CENTER OF GRAVITY POSITION - The position of the center of gravity of an aircraft at its basic weight. Normally only the longitudinal (for-aft) position is considered. However, vertical (up-down) and lateral (side-side) positions may require occasional considerations.

BASIC EQUIPMENT - The non-expendable equipment common to all configurations for which the aircraft is designed.

B

BASIC MOMENT - The summation of the moments of all items included in the aircraft basic weight. Normally refers to Basic Longitudinal Moment. Occasionally a requirement exists for Basic Vertical Moment and/or Basic Lateral Moment. It is necessary, therefore, to use the proper qualifying adjective.

BASIC WEIGHT - The sum of weight empty plus the weight of items not in the useful Load Data. Examples of items contained in the basic weight are unusable fuel, trapped and unusable engine oil, ballast, survival gear/kits, and oxygen equipment. The aircraft current basic weight is always the last entry in the aircraft historical records (DD Form 365-2) for that specific aircraft or group of aircraft.

BASIC WEIGHT CHECK LIST - A completed collection of DD Form 365-1 forms. Commonly called Chart A. It is a partial listing of items, by compartments, which are, or may be installed in the aircraft at the time of weighing. The primary purpose of the check list is to establish the aircraft equipment inventory at the time of the aircraft weighing.

BUTTLINES (BL) - Reference locations in the lateral (left or right) direction from aircraft lateral (side to side) reference datum or aircraft centerline. The axis is expressed from the pilots operating position. A popular convention is to take the side that the pilot sits on as the positive (+) axis. For fixed wing aircraft this is the left side as shown, for rotary wing aircraft, this is the right side. SAWE RP-6A recommends that the Right Hand Rule be followed, with the positive direction to the right. Refer also to: ANSI/AIAA R-004-1990 and MIL-A-8591G.

C

CG - The abbreviation for the Center of Gravity.

CENTER OF GRAVITY (CG) - That point about which the aircraft would balance if suspended. For field weight and balance control, the center of gravity is normally calculated only along its longitudinal axis (nose to tail), disregarding both lateral and vertical location.

CENTER OF GRAVITY LIMITS - The extremes of movement that the center of gravity can have without making the aircraft unsafe for flight. The center of gravity of the loaded aircraft must always be, and remain, within these specified limits at takeoff, during flight, and on landing.

CENTER OF GRAVITY RANGE - The distance between the above mentioned center of gravity limits. The range may vary in length from 3 or 4 inches for a small aircraft or helicopter up to 150 to 300 inches for a large aircraft.

CENTROID - The average ARM or Center of Gravity of a compartment such as a fuel tank, or piece of equipment.

CHART A - DD Form 365-1. Equipment inventory by description, weight, arm and simplified moment. See Basic Weight Check List.

CHART C - DD Form 365-3. The Historical Basic Weight and Balance Record, by aircraft serial number, of the weight and balance changes for a particular aircraft.

CHART E - Detail loading information, weighing instructions, fuel tables, and miscellaneous information. Refer to Loading Data.

CHORD - An imaginary straight line joining the leading and trailing edges of an airfoil.

C

COMPARTMENT - A defined section of the aircraft load-carrying space.

COMPARTMENT ARM - The horizontal distance from a defined reference datum to a compartment centroid.

CONFIGURATION - A specific arrangement and quantity of structure, systems, internal and external stores, fuel and/or other items. Also used to define the position of flaps, slats and landing gear.

D

DD Form 365 - Record Of Weight And Balance Personnel.

DD Form 365-1 - Basic Weight Checklist. Chart A.

DD Form 365-2 - Aircraft Weighing Record. Form B.

DD Form 365-3 - Basic Weight and Balance Record. Chart C.

DD Form 365-4 - Weight and Balance Clearance. Form F.

DESIGN GROSS WEIGHT - The weight at which the aircraft is designed to fly and upon which performance calculations and manufacturers guidelines are based.

DRAINABLE FUEL - The amount of internal/external fuel that can be drained from the aircraft tanks through normal drain points after defueling.

E

ENGINE START - The loaded aircraft condition immediately prior to starting the engine. Refer to Ramp Weight.

EQUILIBRIUM - A condition in which all acting influences are canceled by others, resulting in a stable balanced or unchanging system.

EXPENDABLE LOAD - Includes fuels, cargo/stores that may be air dropped or by other means. Load data can be found in the -5 Chart E Loading Technical Manual for the specific aircraft type/model.

F

FLIGHT DESIGN GROSS WEIGHT - A variable condition based on the type of aircraft. Normally it is the weight of the aircraft including internal fuel, pilot/pilots and other required personnel.

FLIGHT GROSS WEIGHT - The weight of the aircraft, its contents and external items during the flight. Also known as flight weight and/or inflight weight.

FORM B - The Aircraft Weighing Record. Form DD Form 365-2.

FORM F - Weight and Balance Clearance. DD Form 365-4.

FORWARD CENTER OF GRAVITY LIMIT - The most forward permissible aircraft center of gravity location for a specific weight and configuration.

FULCRUM - A pivot or support about which items can be balanced or rotated.

FUSELAGE STATION (FS) - Reference stations measured in the longitudinal direction (forward to aft) from a reference datum normally at, or well forward of the aircraft nose. Refer to Reference Datum.

G

g FACTOR - The ratio of the force that is imposed upon the aircraft and its contents when accelerated or decelerated, in any direction, compared with its normal mass. It is expressed in relation to earth gravitational force of 1g. For example: If an item of load that weighs 1000 pounds is subjected to an acceleration of 3 Gs then a force of 3000 pounds has been imposed upon that item. The force may act in any direction.

GROSS WEIGHT (GW) (aircraft usage) - The total weight of the aircraft including its contents. The Gross weight continually changes throughout ground and/or flight operations. (Referred to as All-Up Weight in Europe).

GROSS - Total weight on scales. Also associated with; total, all-inclusive, dozen, in bulk, wholesale. French: big, thick.

GUMC - Gear up moment correction.

H - I

INDEX VALUE - Refer to Moment.

J - K

JIG POINT - A hole, fitting or other location that is the same known distance from each reference datum for all aircraft of the same model designation.

L

LANDING GROSS WEIGHT - The weight of the aircraft, its contents, the estimated landing fuel, and all other non-expendables when the aircraft lands. An integral part of the Form F flight information.

LATERAL AXIS - An imaginary line passing through the center of gravity, parallel to the axis of pitch and at right angles to the reference plane for lateral load arms.

LEMAC - An abbreviation for Leading Edge of the Mean Aerodynamic Chord. Referred to as a fuselage station.

LEVELING LOCATIONS - Fixtures (Leveling Lugs) or locations (attached to or built into the aircraft structure) whose purpose is supporting a spirit level, inclinometer, or suspended plumb bob. Visual reference readings showing the horizontal and/or lateral level condition of the aircraft.

LEVER - A simple machine consisting of a rigid body pivoted on a fixed fulcrum.

LOAD ARM - Refer to ARM.

LOADING CONTROL - The use of weight and balance forms and loading data to ensure that the aircraft weight, center of gravity, and other loading limitations are not exceeded during flight and/or ground operations.

L

LOADING DATA - Part of the aircraft's -5 series technical manual. Commonly referred to as Chart E. Contains instructions for weighing the aircraft, aircraft diagrams, loading limits, general instructions affecting loading of the aircraft, and the weight, arm and moment information necessary to perform loading control.

LOADING LIMITS - Restrictions such as permissible center of gravity range and gross weight, beyond which aircraft loading is not permitted.

LONGITUDINAL AXIS - An imaginary line passing through the center of gravity, parallel to the axis of roll and at right angles to the reference plane for longitudinal load arms.

M

M - Refer to Moment.

MEAN AERODYNAMIC CHORD (MAC) - An engineering term used to describe an airfoil chord in aircraft design. It is of constant length. Also used in the calculation of center of gravity location in terms of percent (%) MAC. The average of the entire wing chords on the applicable aircraft model. Sometimes referred to as the Mean Aerodynamic Chord Line or MACL.

MAW - Moment, Arm, Weight.

MAXIMUM GROSS WEIGHT - Refer to Allowable Gross Weight.

MOMENT (MOM) - A measure of the rotational tendency of a weight about a point. The weight of an item multiplied by its arm.

N

NEGLECTIBLE CHANGE - Unless specified in the -5 T.O.'s a negligible weight is any change of $\pm 0.1\%$ of the basic weight and/or moment change that moves the center of gravity $\pm 0.1\%$ of the MAC.

NET - The Gross weight minus the TARE weight. Also associated with; free of all charges, clear of TARE, netting, netted. French definition: clean, clear.

NON-PUMPABLE FUEL - The fuel remaining in the internal fuel tanks after defueling at a specific attitude/condition.

NOSE HEAVY - A condition of improper balance in which the center of gravity is forward of the established limits.

O

OPERATING WEIGHT (OW) - The sum of the aircraft basic weight, crew, emergency equipment, special equipment for a mission, and all other non-expendable items as applicable. The starting point for determining the mission most forward and most aft center of gravity conditions.

OVERLOADING - The addition of weight to an aircraft increases the hazards of flying because the lifting and turning forces must be increased in proportion to the increase in weight. A heavily loaded aircraft is less maneuverable, has a higher stalling speed, a lower ceiling, and requires a longer takeoff run.

P - Q

PERCENT MAC - Location expressed as a percentage of the Mean Aerodynamic Chord.

PERMISSIBLE GROSS WEIGHT - Refer to Allowable Gross Weight.

PERMANENT BALLAST - Ballast that must be installed in the aircraft at all times.

R

RAMP WEIGHT - Engine start condition. Refer to Form F - Ramp Weight to review conditions. Things to consider are extra fuel allowed for engine start, warmup and taxi.

RECOMMENDED MAXIMUM GROSS WEIGHT - The maximum Gross weight that an aircraft can be loaded to and still maintain the desired margins of safety established by the contracting authority.

RECOMMENDED MAXIMUM LANDING GROSS WEIGHT - The maximum weight that the aircraft can safely land at. Sometimes this weight is less than the recommended maximum gross weight.

RECORD OF WEIGHT AND BALANCE PERSONNEL - The DD Form 365 used to provide a continuous record of the weight and balance for personnel responsible for maintaining the aircraft weight and balance handbooks.

REFERENCE DATUM (RD) - The zero reference position from which all distances are measured for balance purposes. Aircraft have three zero reference datum lines from which locations are measured:

- **Lateral** - Butt Lines (BL)
- **Vertical** - Water Lines(WL)
- **Longitudinal** - Fuselage Stations (FS)

The longitudinal datum is normally at or near the nose but may be the wing leading edge, rotor centerline or other part of the aircraft.

REPRESENTATIVE AIRCRAFT - An aircraft chosen as typical of many aircraft of the same model/designation, with similar structure, systems, and equipment configurations.

ROUNDED WEIGHT - A weight rounded to the nearest whole number, either up or down. If a number is less the 0.5 lbs. it is rounded down 0.5 lbs. If the number is greater than 0.5 lbs, the number is rounded up by 0.5 lbs.

S

SCALE FACTOR CORRECTION - Modifies scale readings due to the inherent accuracy of the scales. Other factors may include but are not limited to scale calibration factors, inability of the electronic load cell zero set to return to zero after unloading the cells and latitude correction.

SERVICE WEIGHT PICKUP - Known and unknown weight changes due to undocumented repairs and modifications, wear, dirt, moisture and other operational/environmental factors.

SIMPLIFIED MOMENT - Moment(s) divided by an established constant such as 10, 100, 1000, etc.

STRUCTURAL STATION - A station or location such as a bulkhead labeled for reference on an engineering drawing. Structural stations may or may not be identical with balance or fuselage stations.

T

TAIL HEAVY - A condition of improper balance in which the center of gravity is aft of the aft limit.

TAKEOFF GROSS WEIGHT (TOGW) - The Gross weight of the aircraft at the time the aircraft becomes airborne.

TARE (Aircraft Weighing) - The weight of any support equipment necessary to weigh the aircraft. Example of support equipment included as part of the weighed total but not part of the aircraft weight are chocks, blocks, slings and jacks. It can be a scale factor correction. For all aircraft, the jack pads are part of the TARE correction when using a load cell/jack weighing procedure.

TARE (General Scale Use) - The weight of the container in which goods are packed and weighed, deducted from the Gross weight in order to arrive at the Net weight. Also associated with; taring, tared - ascertain the weight of a container. From Arab: Tarhah - the part that is thrown away.

TARE Mechanism - A mechanism designed for determining or balancing out the weight of packaging material, containers, or other materials that are not part of the Net weight determinations.

TEMPORARY BALLAST - Item(s) used to simulate or replace any missing item. Temporary ballast may simulate a missing crew member, a piece of equipment, or other items to maintain the aircraft within the specified center of gravity limits and/or simulate a specific aircraft condition or configuration.

TIME COMPLIANCE TECHNICAL ORDER (TCTO) - An addition, deletion, and/or rearrangement of equipment authorized by an approved contracting authority. A manufacturer's engineering change proposal.

TRAPPED FUEL - Fuel remaining in the aircraft after defueling the aircraft as prescribed in the -5 T.O. procedure. Fuel that remains after draining can only be removed by disconnecting fuel lines, dismantling components or other maintenance activity.

U

UNACCOUNTABLE WEIGHT - Any change in the basic weight not referenced in Chart C. It is also the difference between the expected scale reading(s) and the actual scale reading(s).

UNUSABLE FUEL - Fuel remaining in the aircraft at fuel starvation or draining the aircraft at flight attitude. Unusable fuel includes trapped fuel.

V

VECTOR - A quantity completely specified by magnitude and direction.

VECTOR PLOT - A presentation prepared using pre-calculated graphical grids on which the arithmetic calculations have been predetermined. Vector Plot is typically associated with fan grid and template devices.

VERTICAL AXIS - An imaginary line passing through the center of gravity parallel to the axis of yaw and at right angles to the reference plane for vertical load ARMS.

W

WATERLINE (WL) - Location in the vertical (up and down) direction measured from a reference below the aircraft.

WEIGHT (W) - A measurement of the weight of an object. The gravitational force exerted on an object is equal to the product of the objects mass and the local value of the earth gravitational acceleration. Any object used to exert a force by virtue of its gravitational attraction to the earth.

WEIGHING REACTION POINTS - Those points upon which aircraft weight is supported during a weighing operation. Examples of weighing reaction points include Jack Pads, Main and Nose Gear.

WEIGHING REFERENCE POINT - Refer to Jig Point.

WEIGHT AND BALANCE HANDBOOK - The continuous and permanent record of the weight and balance condition of a specific aircraft.

WEIGHT EMPTY - An engineering term related primarily to aircraft design. It is the weight of the aircraft by model designation, dry, clean and empty except fluids in closed systems such as hydraulics.

X - Z

ZERO FUEL WEIGHT - The weight of the loaded aircraft less any usable fuel.



COMMON PLATFORM LAYOUTS

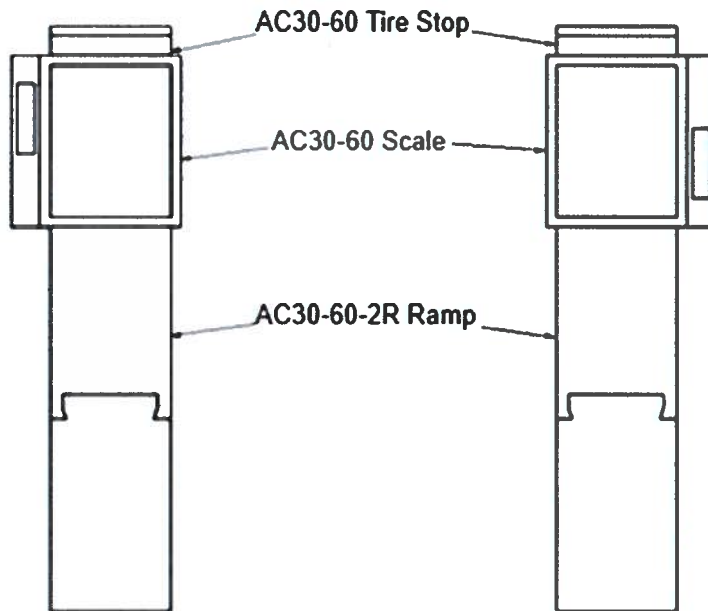
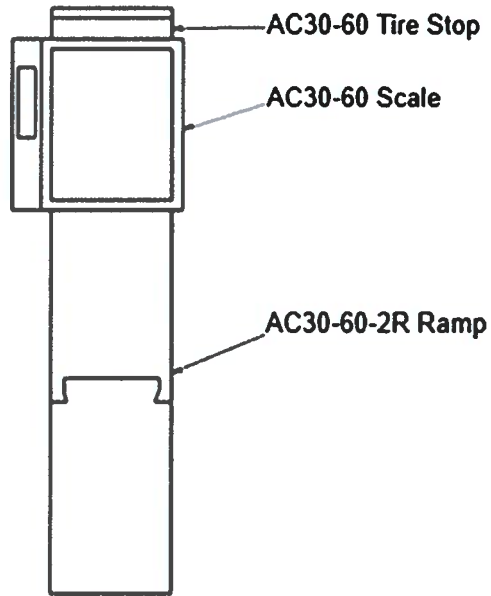


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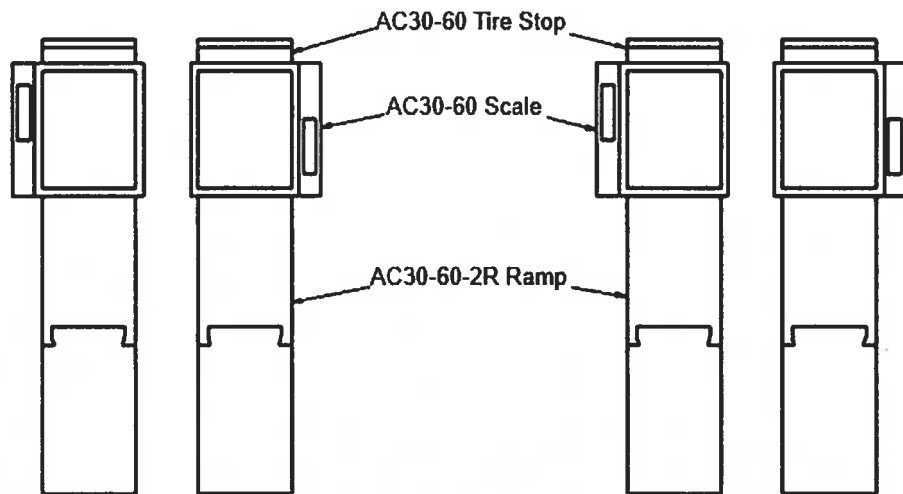
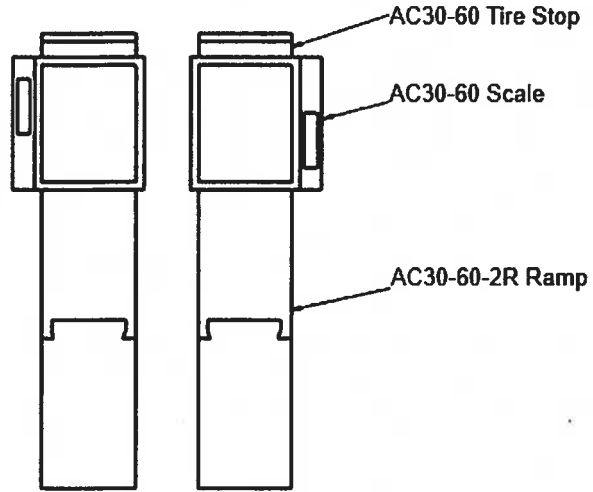
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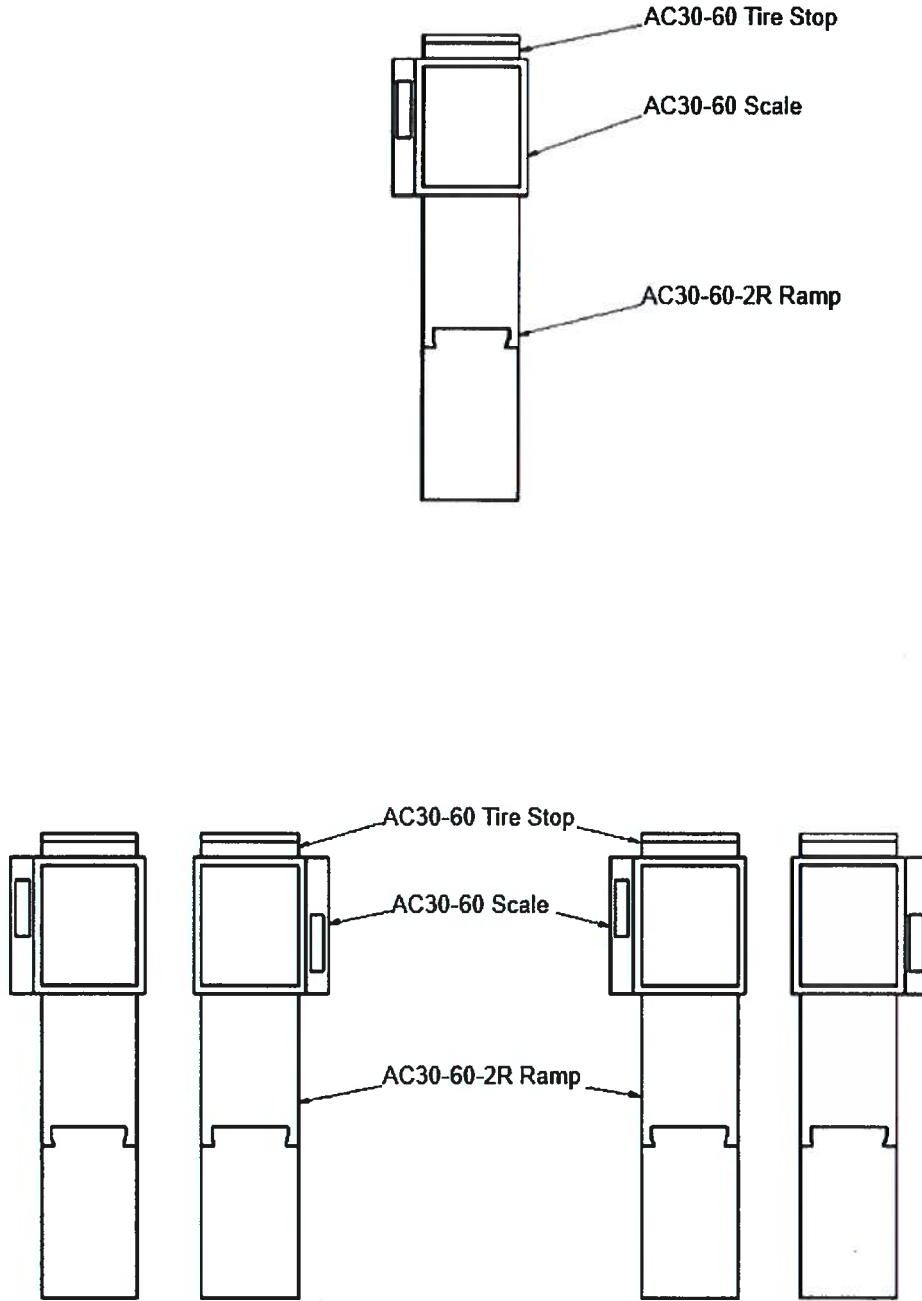
AC30-60 GEAR LAYOUTS GENERIC TRI-GEAR



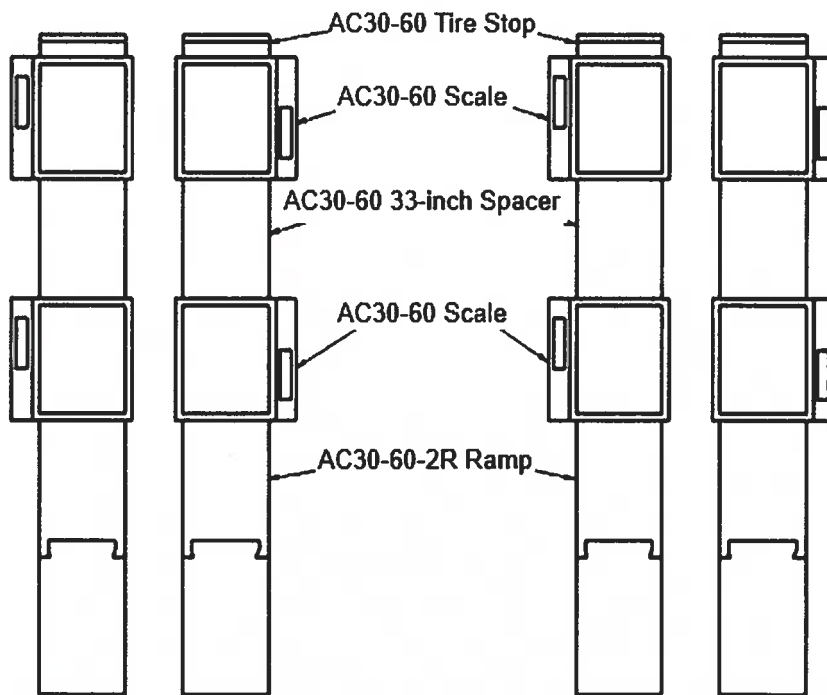
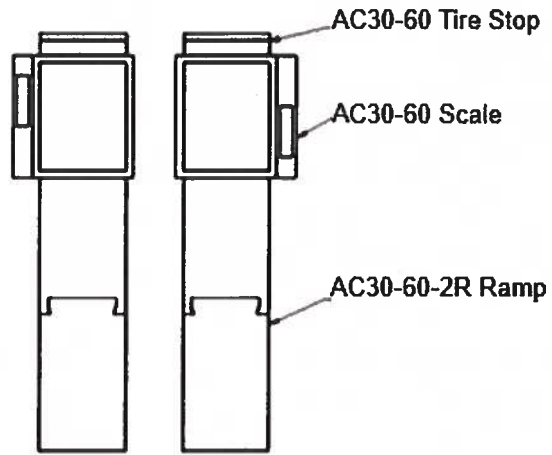
GENERIC TRI-GEAR TWO WHEEL



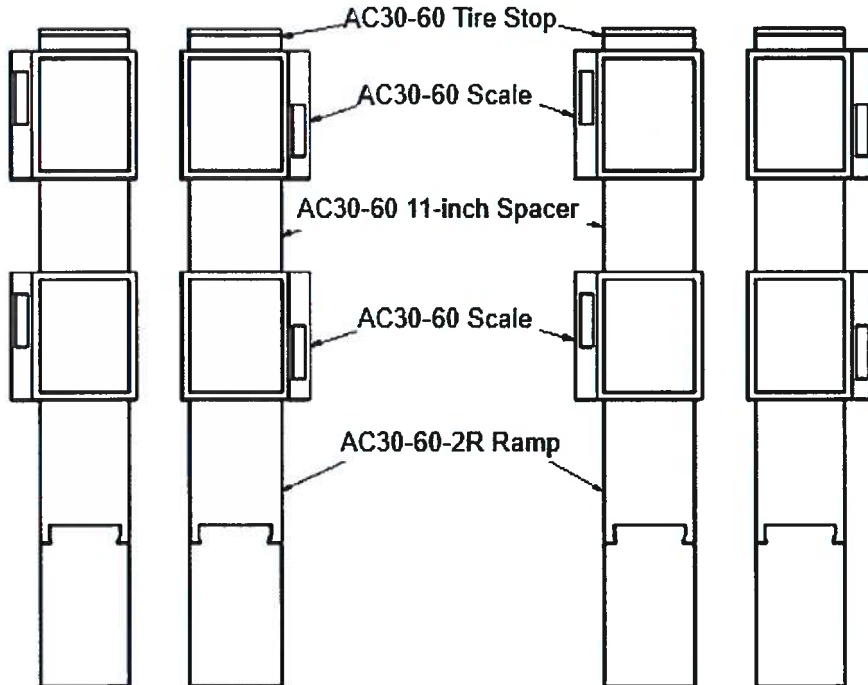
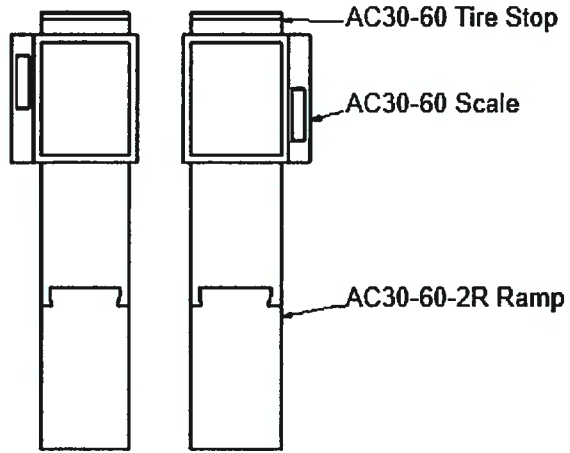
GENERIC TRI-GEAR WITH SINGLE FRONT WHEEL



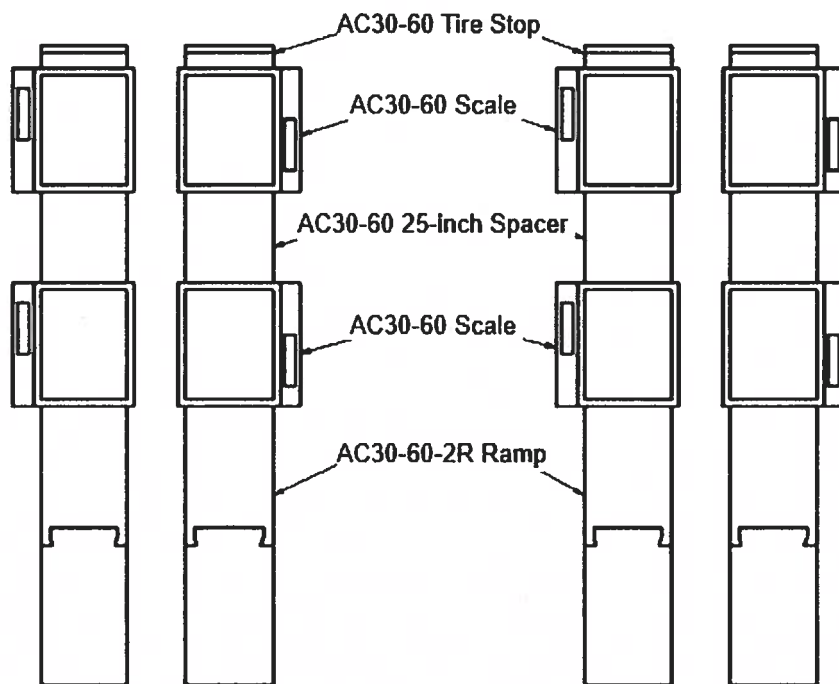
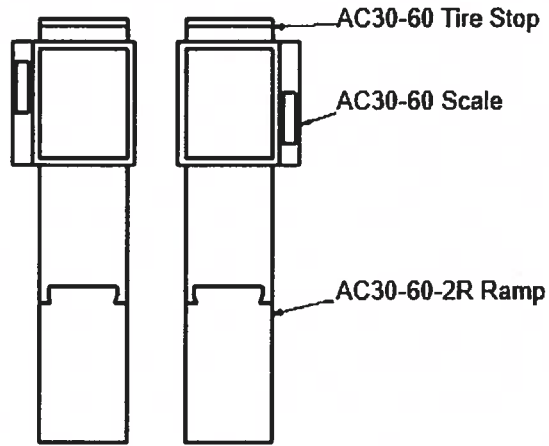
62 - 71 INCH AXLE SPACING



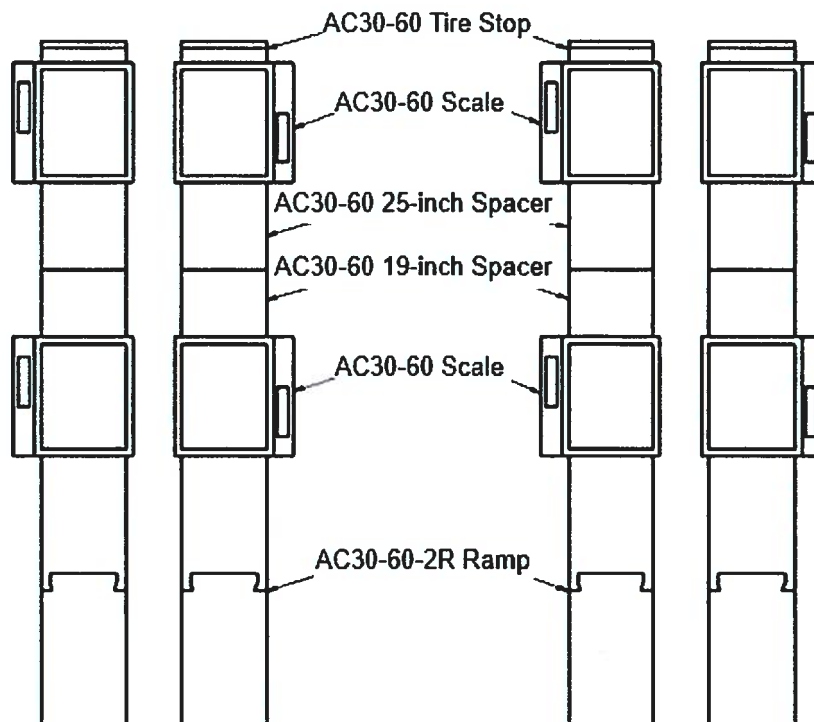
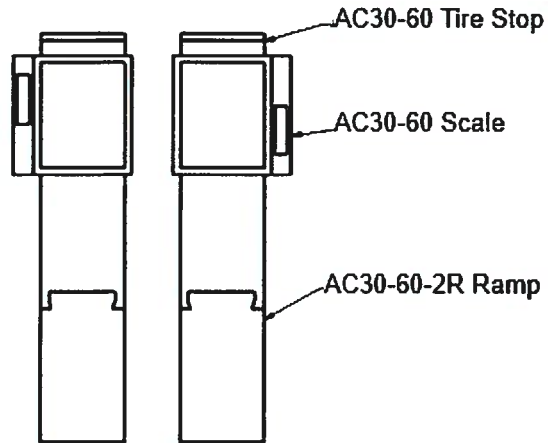
40 - 50 INCH AXLE SPACING



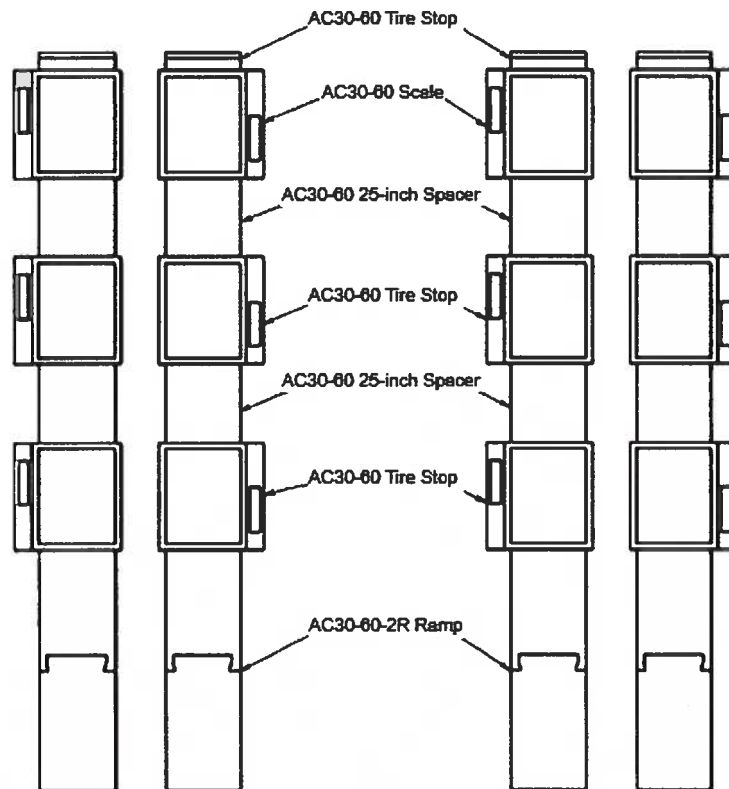
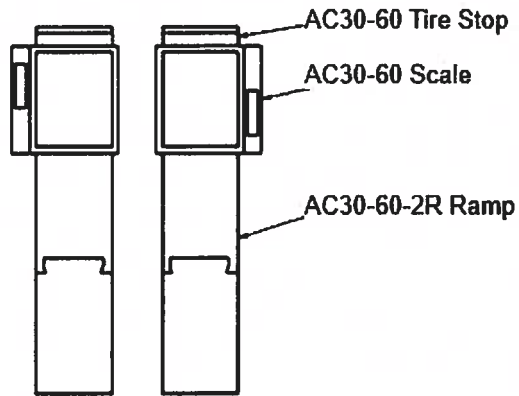
54 - 60 INCH AXLE SPACING



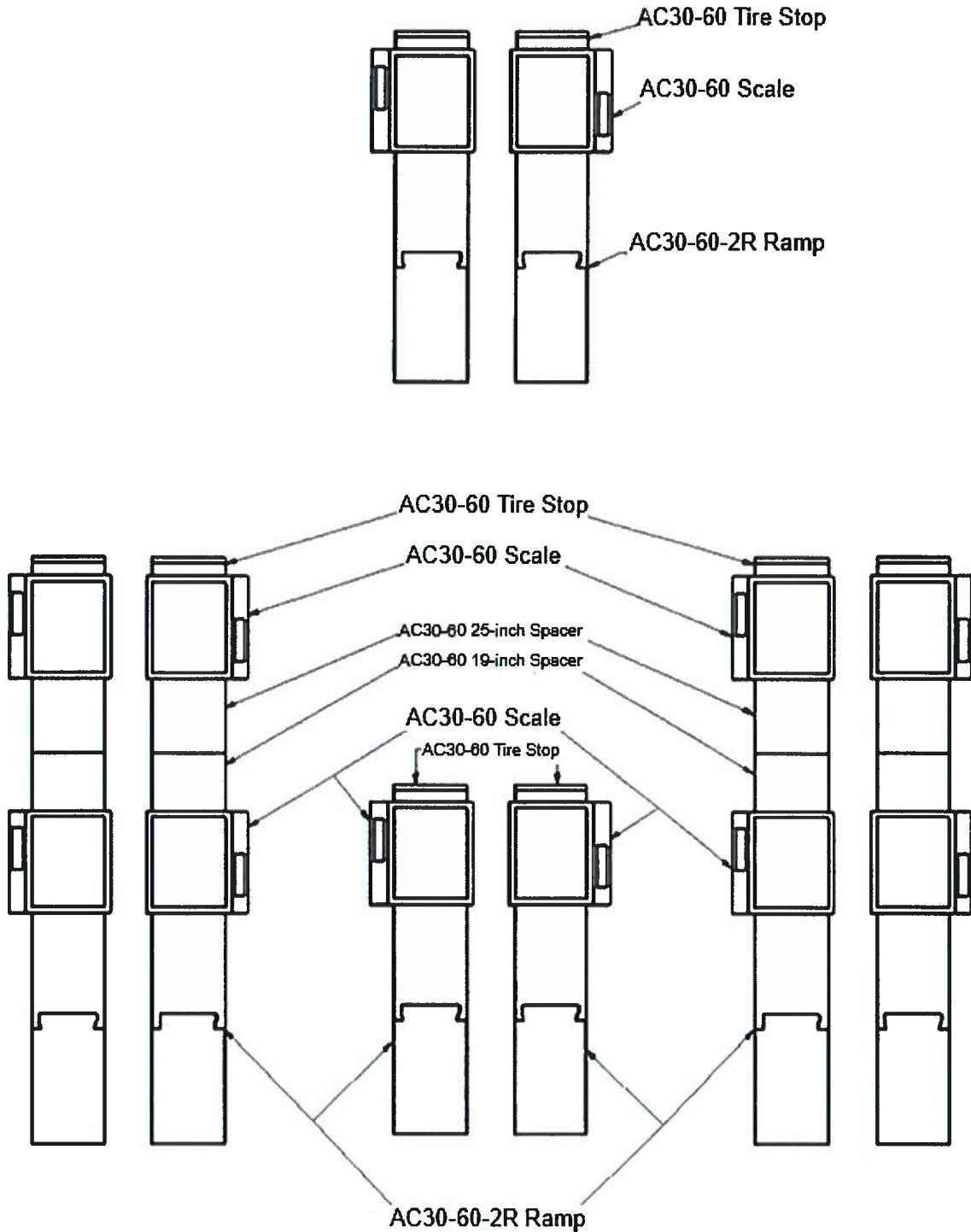
73 - 83 INCH AXLE SPACING



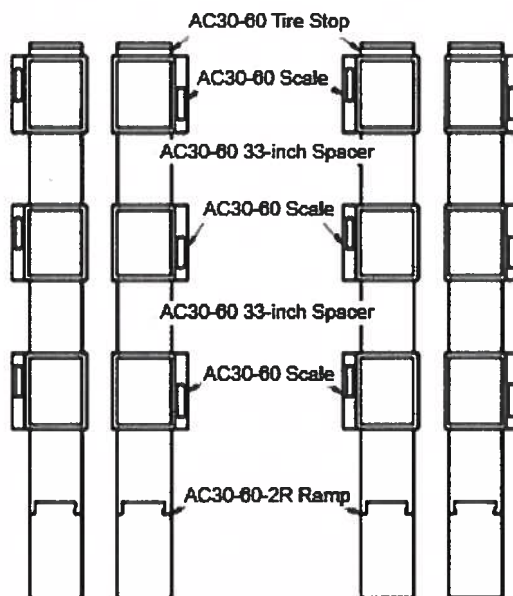
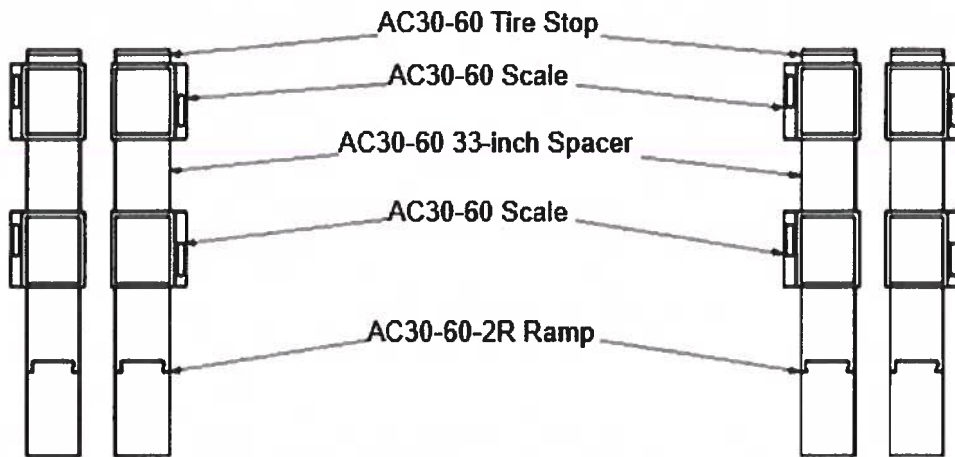
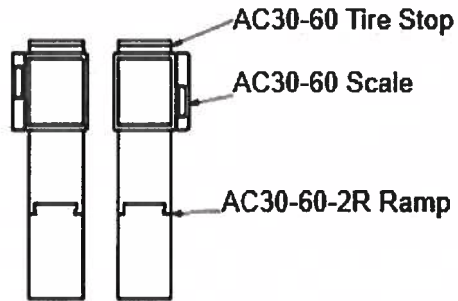
54 - 60 INCH AXLE SPACING 3-WHEEL



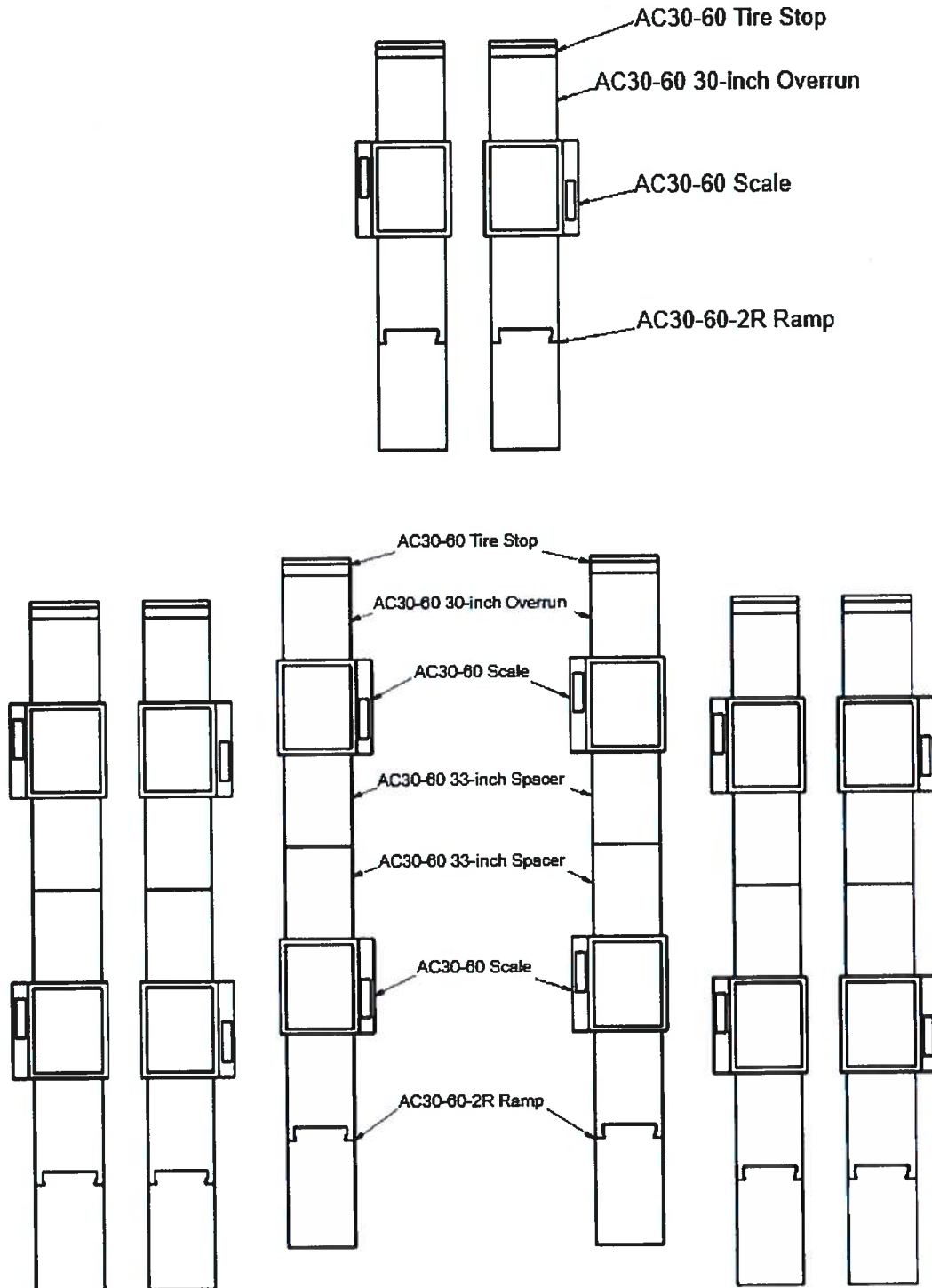
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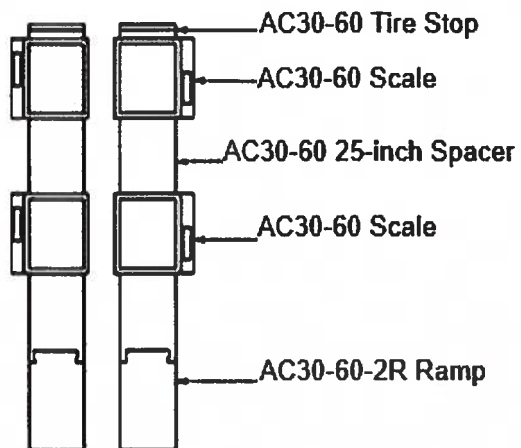
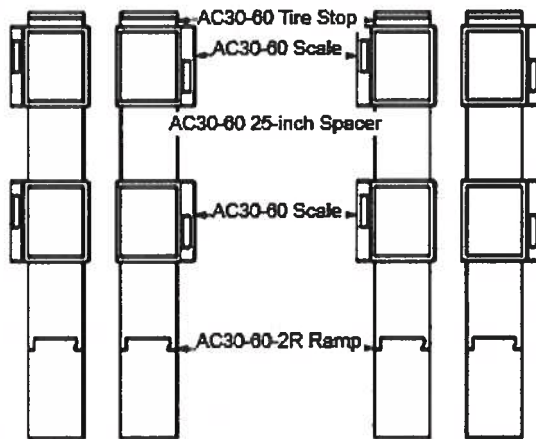
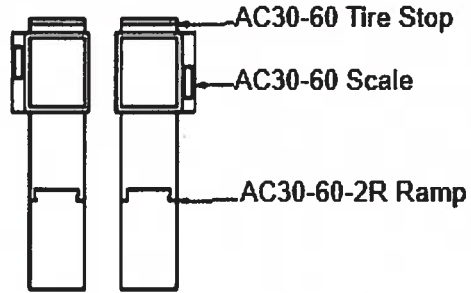
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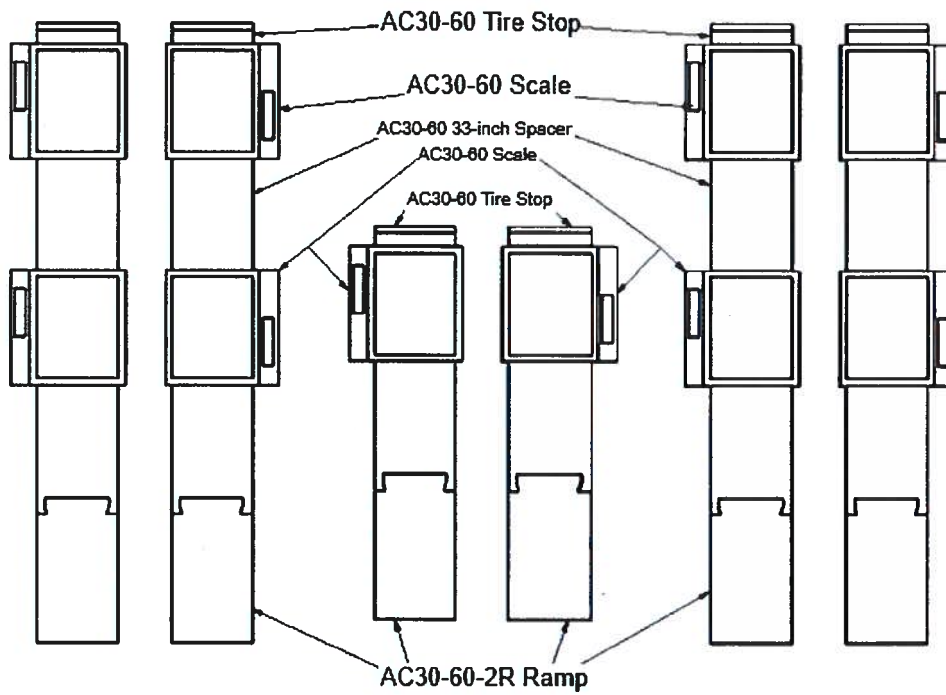
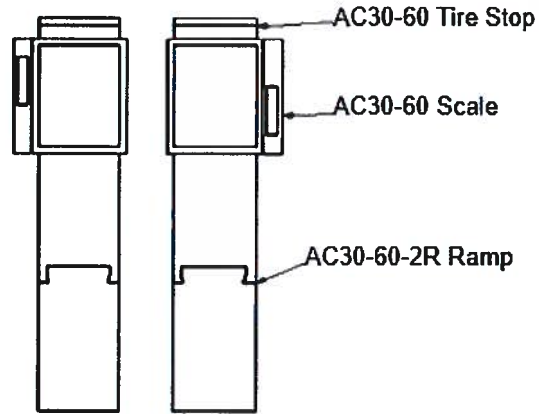
C-17



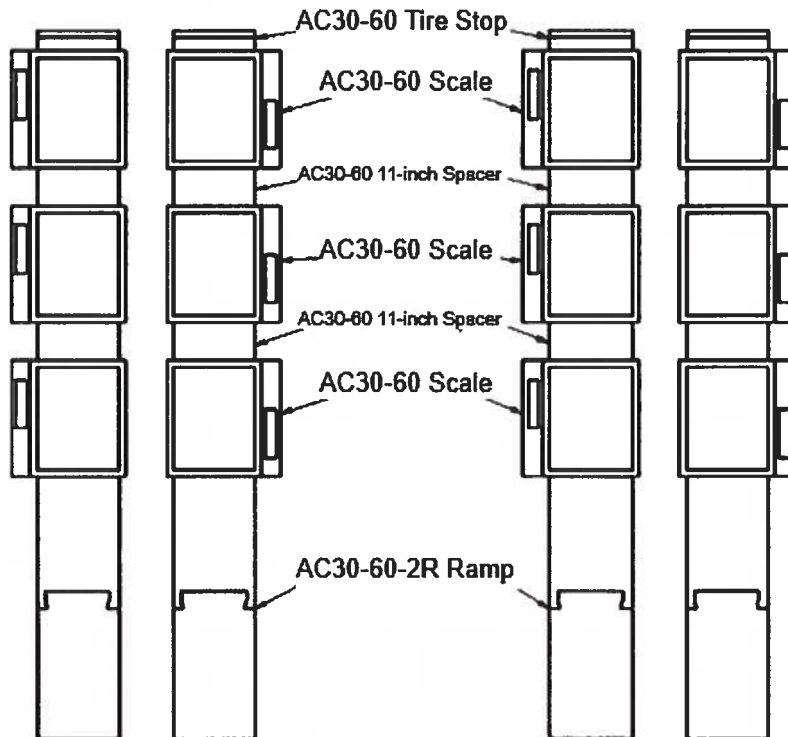
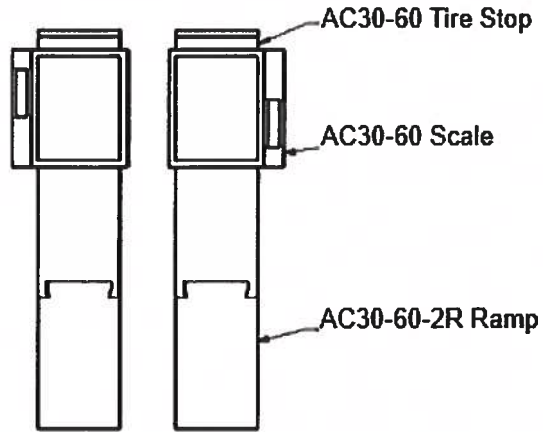
IL-86 & IL-96



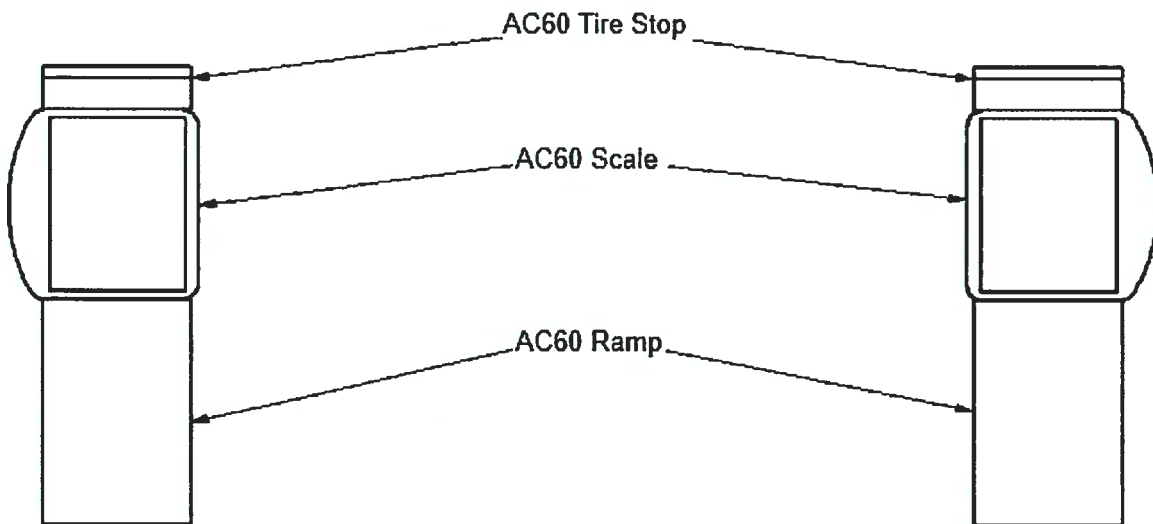
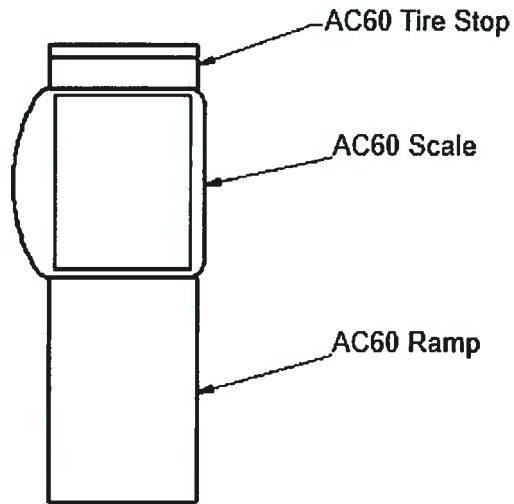
MD-11



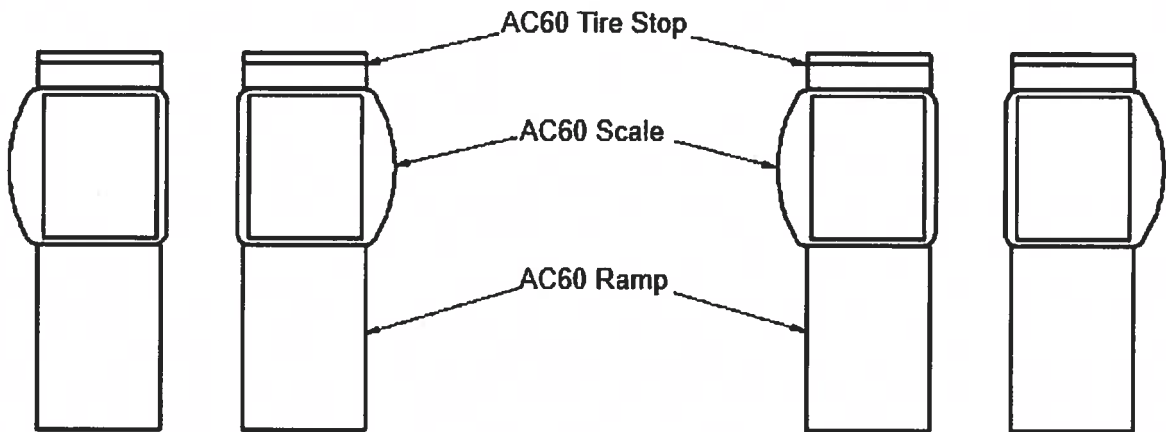
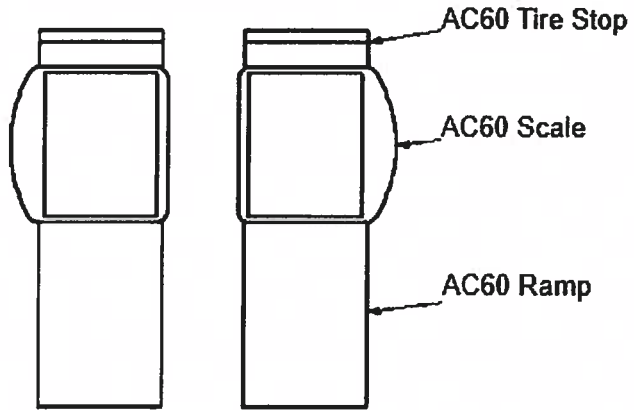
TU-154



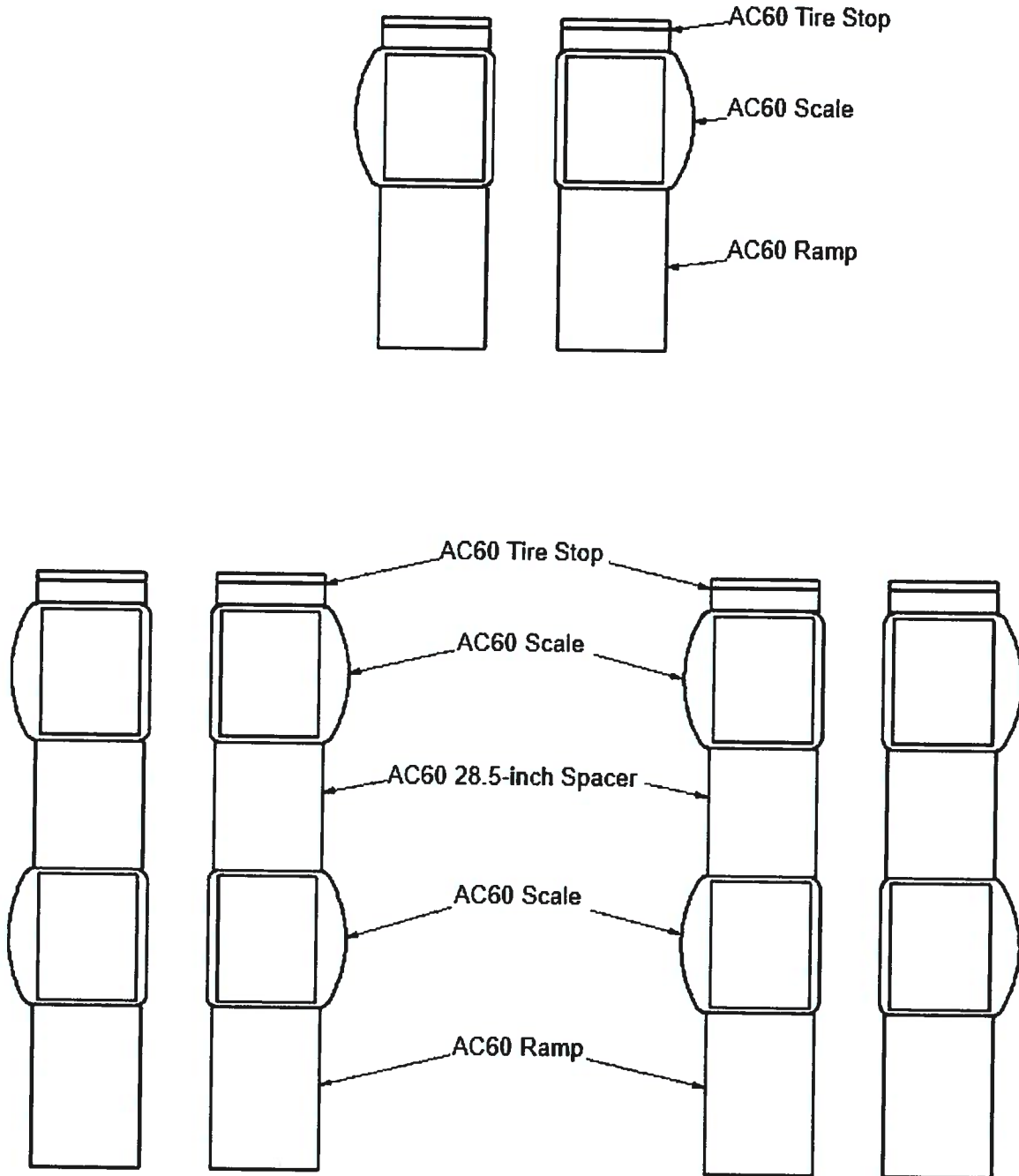
AC60 GEAR LAYOUTS GENERIC TRI-GEAR



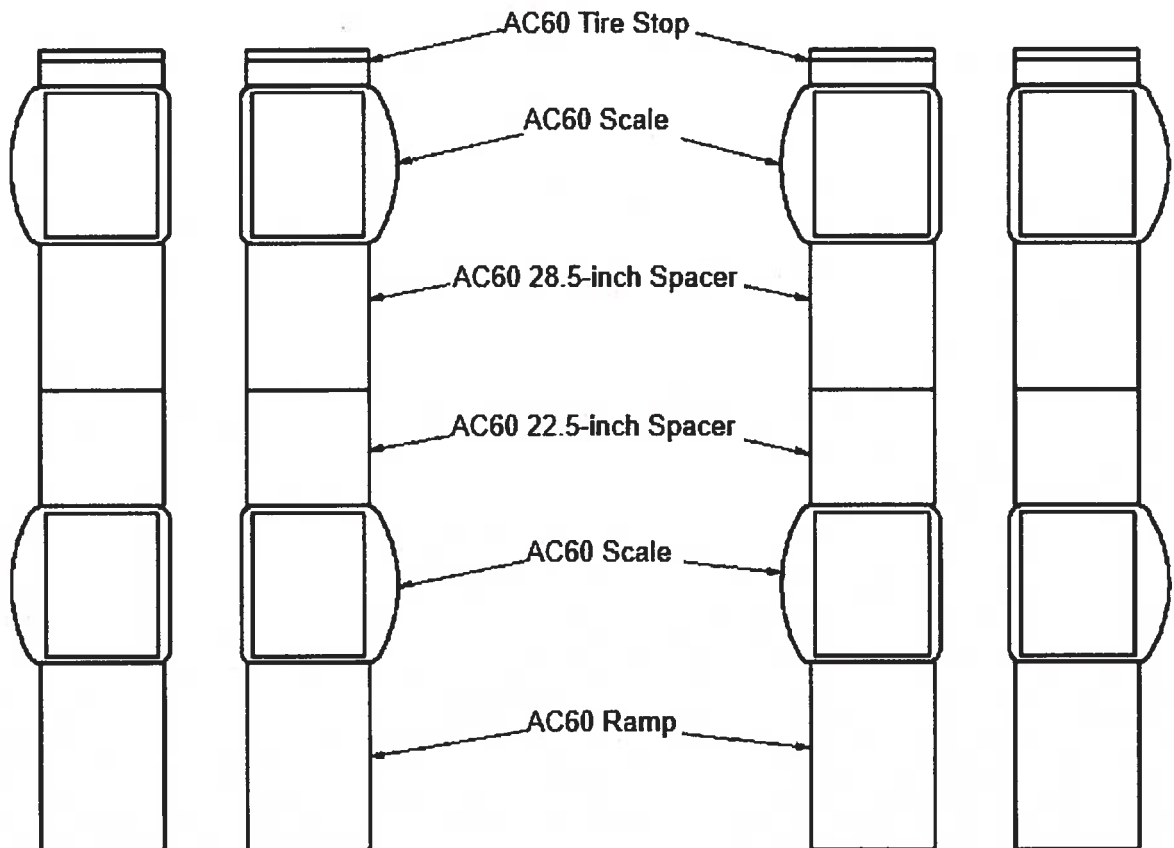
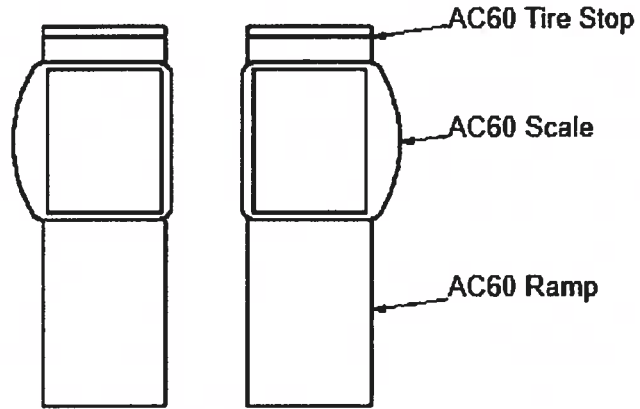
GENERIC TRI-GEAR TWO WHEEL



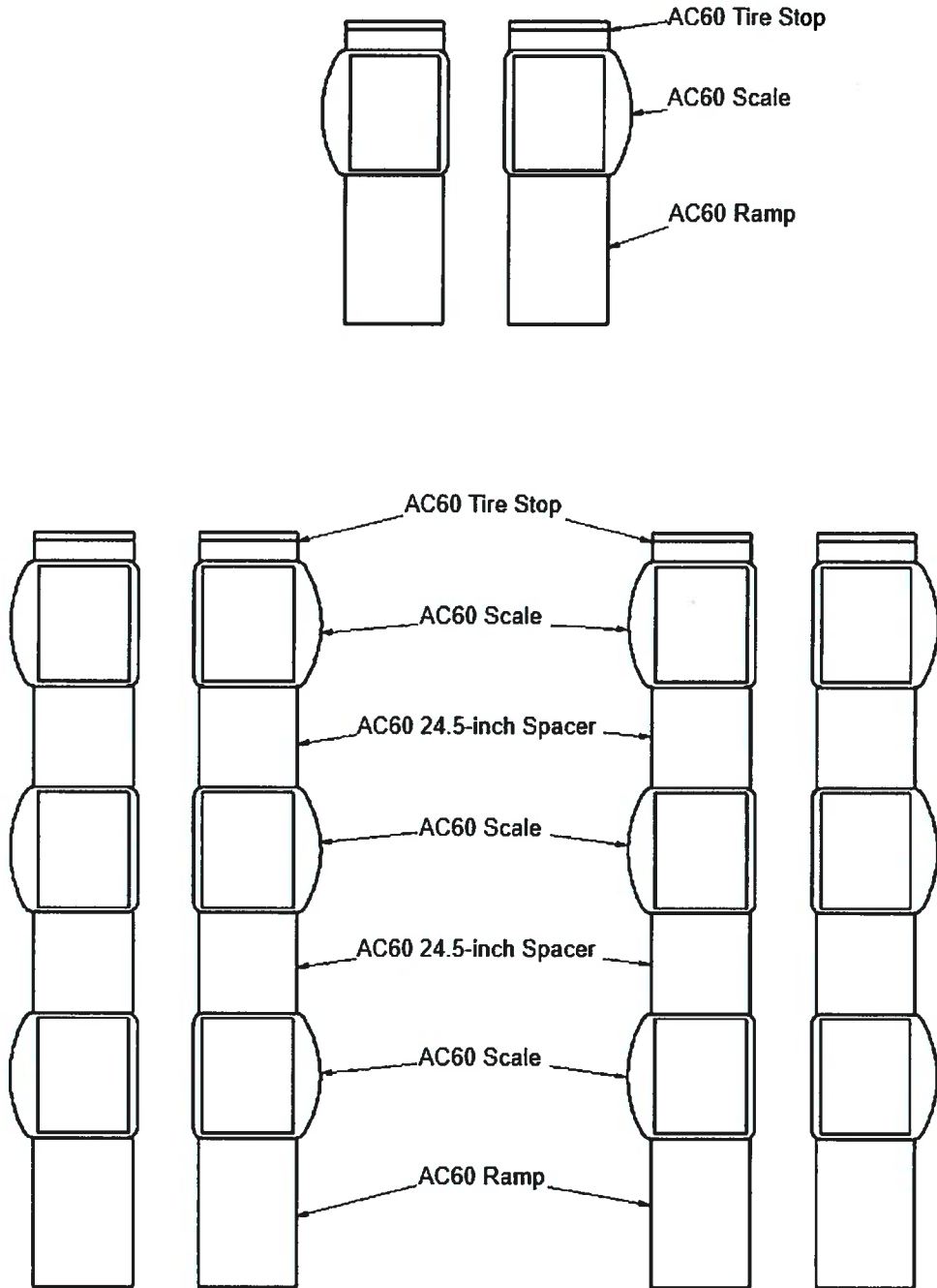
56 - 62 INCH AXLE SPACING



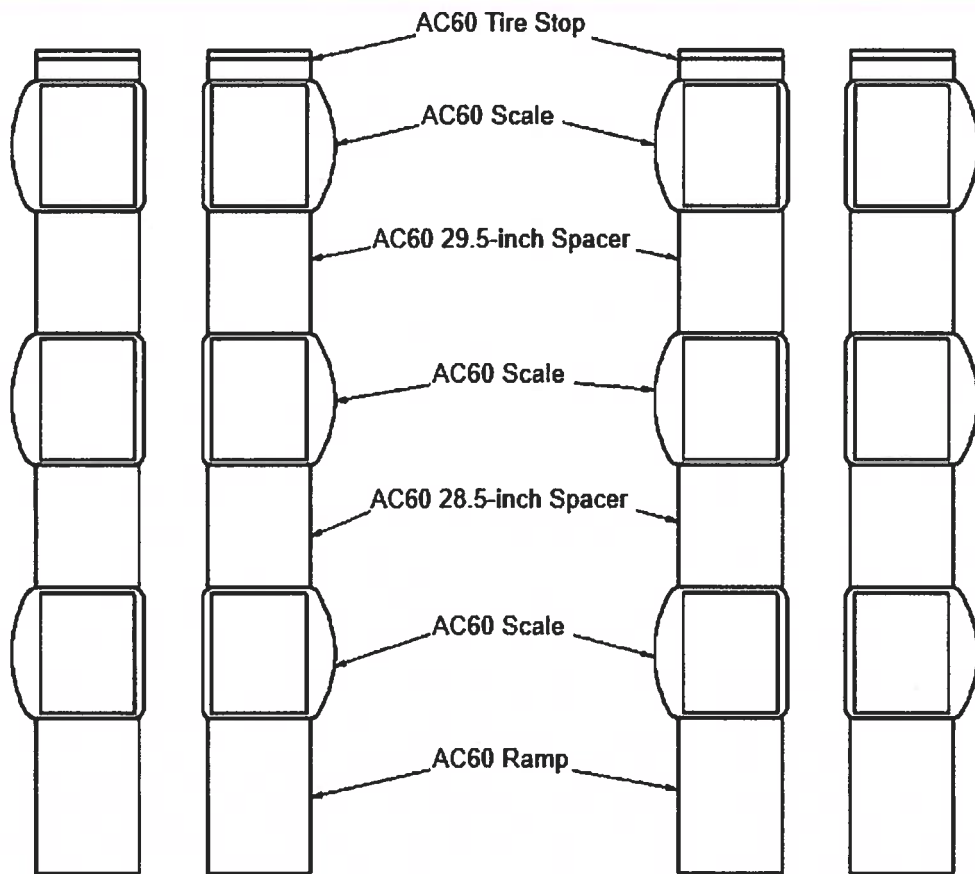
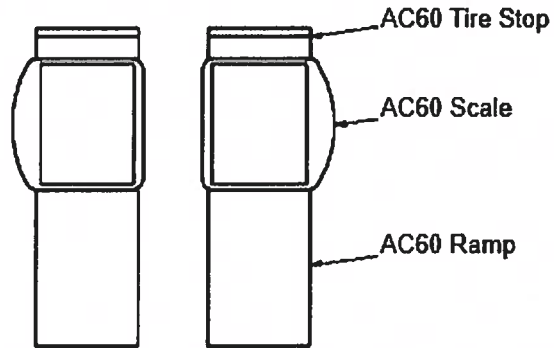
78 - 84 INCH AXLE SPACING



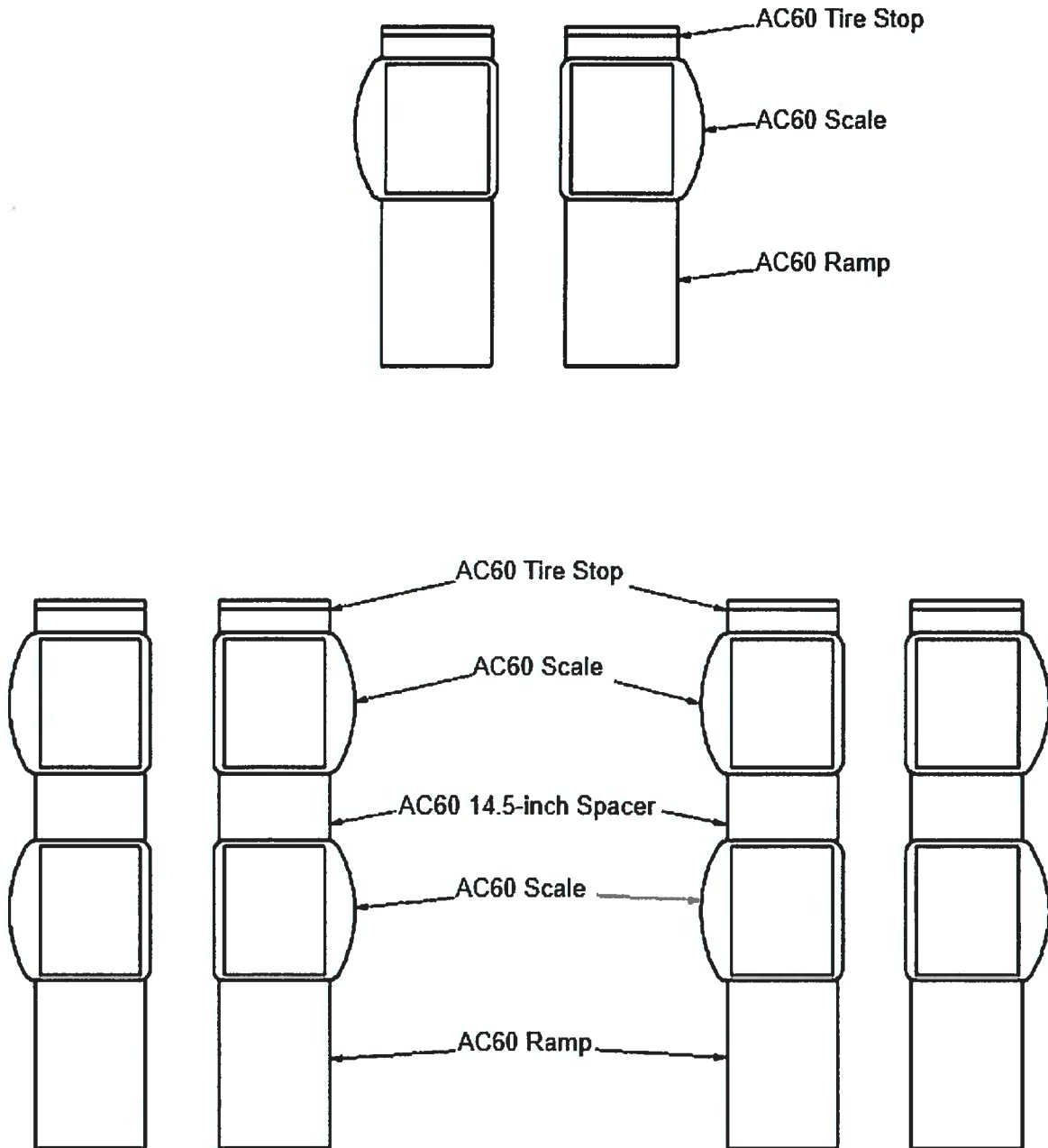
52 - 58 INCH AXLE SPACING 3-WHEEL



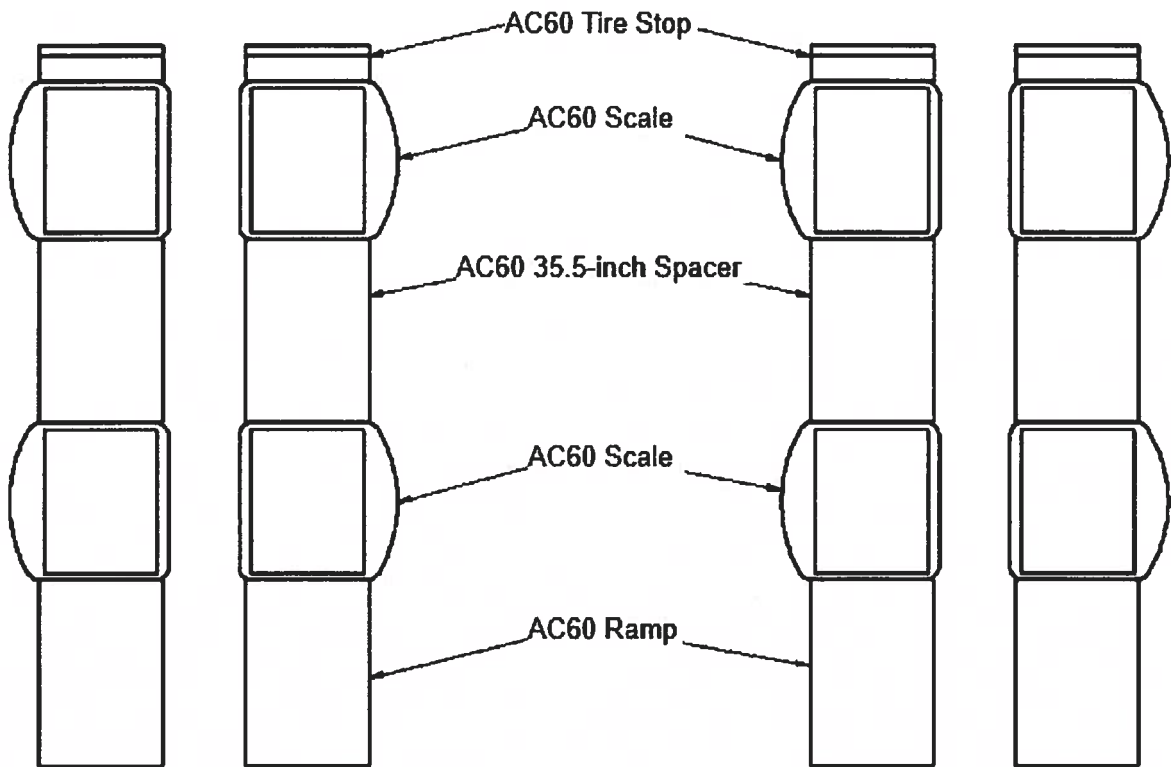
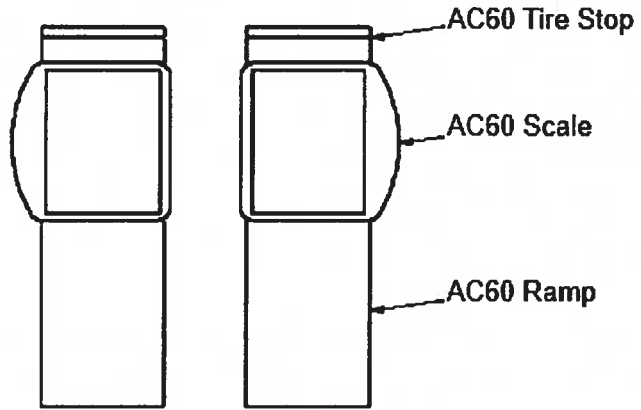
56 - 62 INCH AXLE SPACING 3-WHEEL



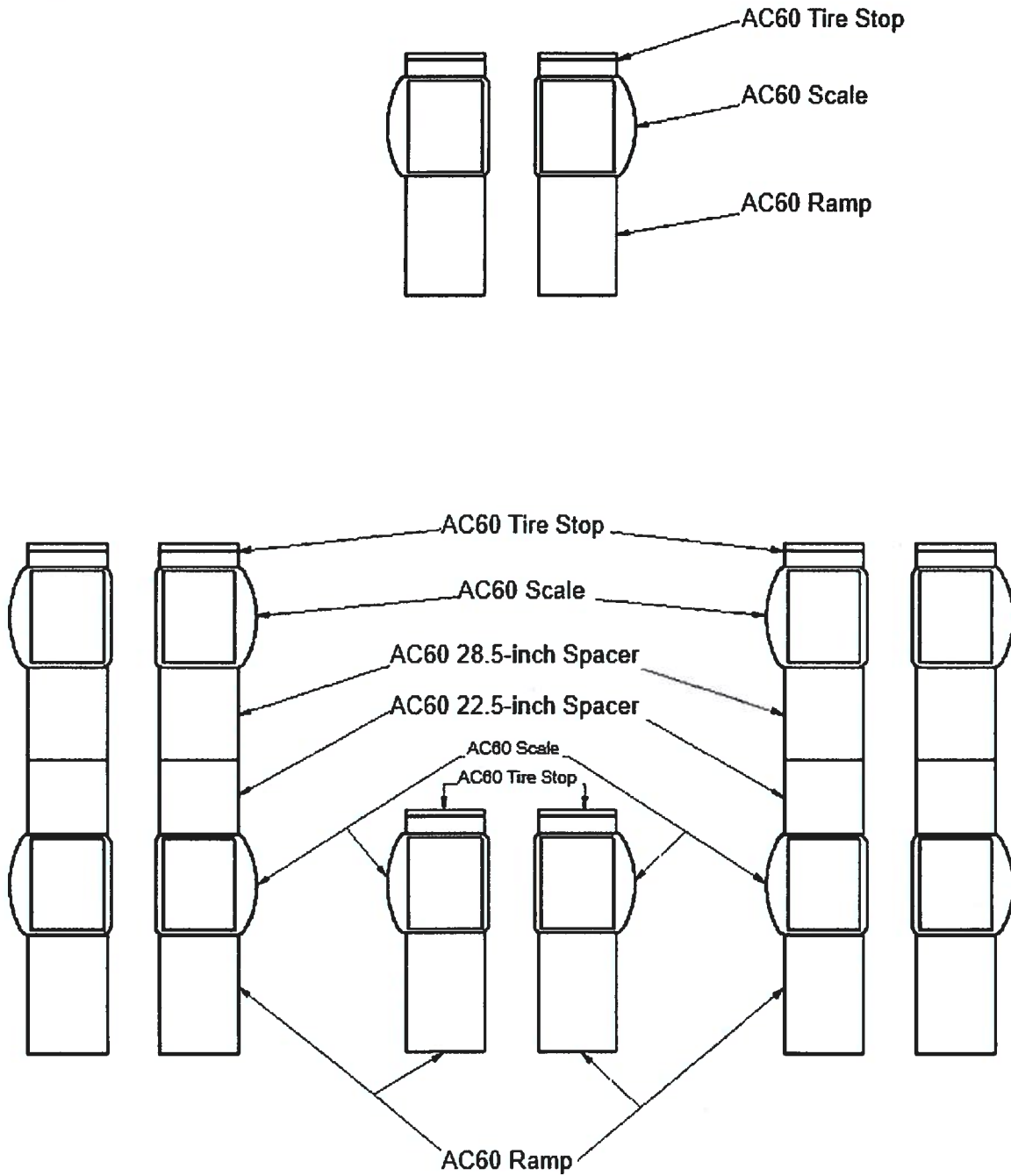
41 - 49 INCH AXLE SPACING



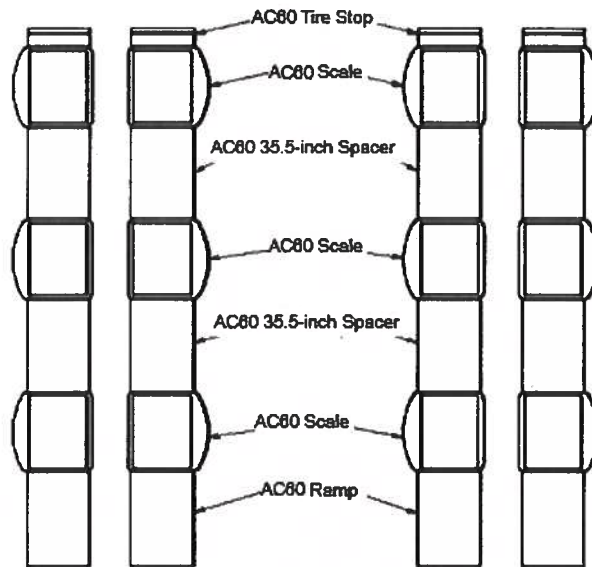
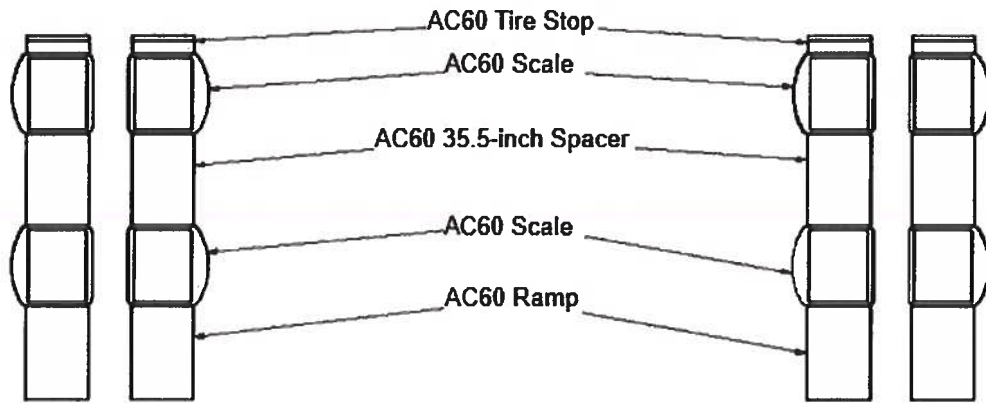
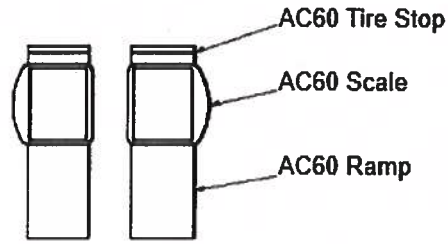
61 - 69 INCH AXLE SPACING



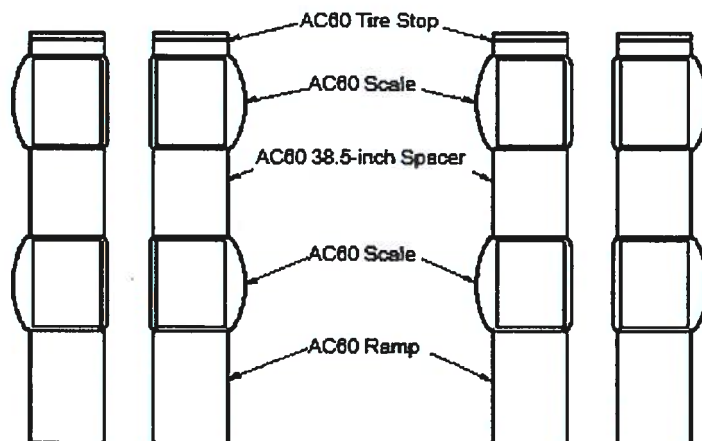
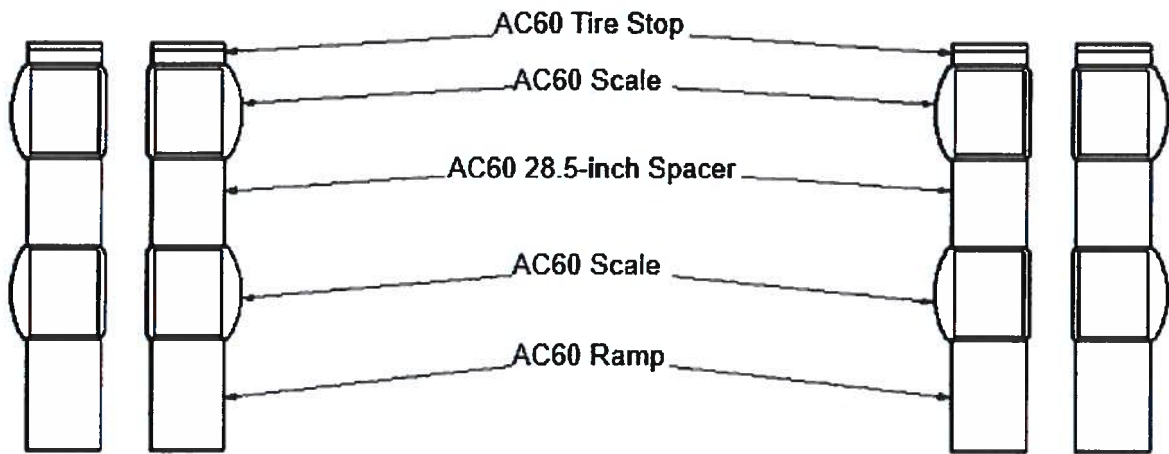
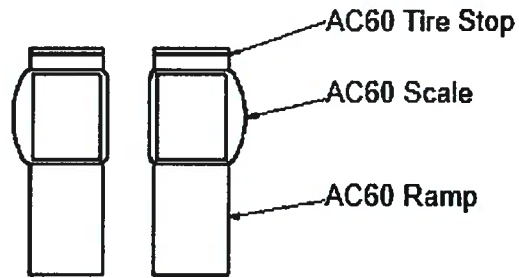
A340



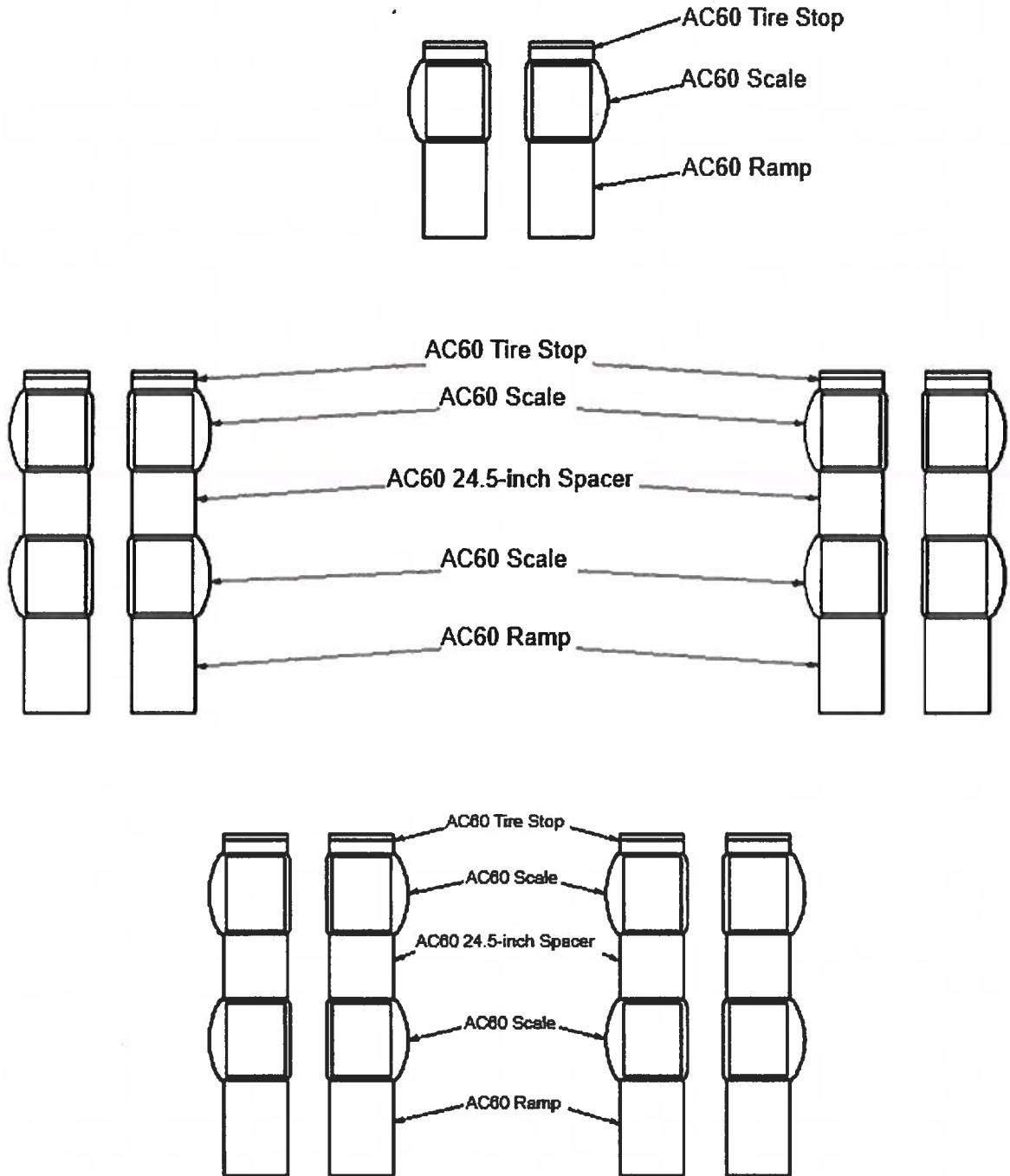
A380



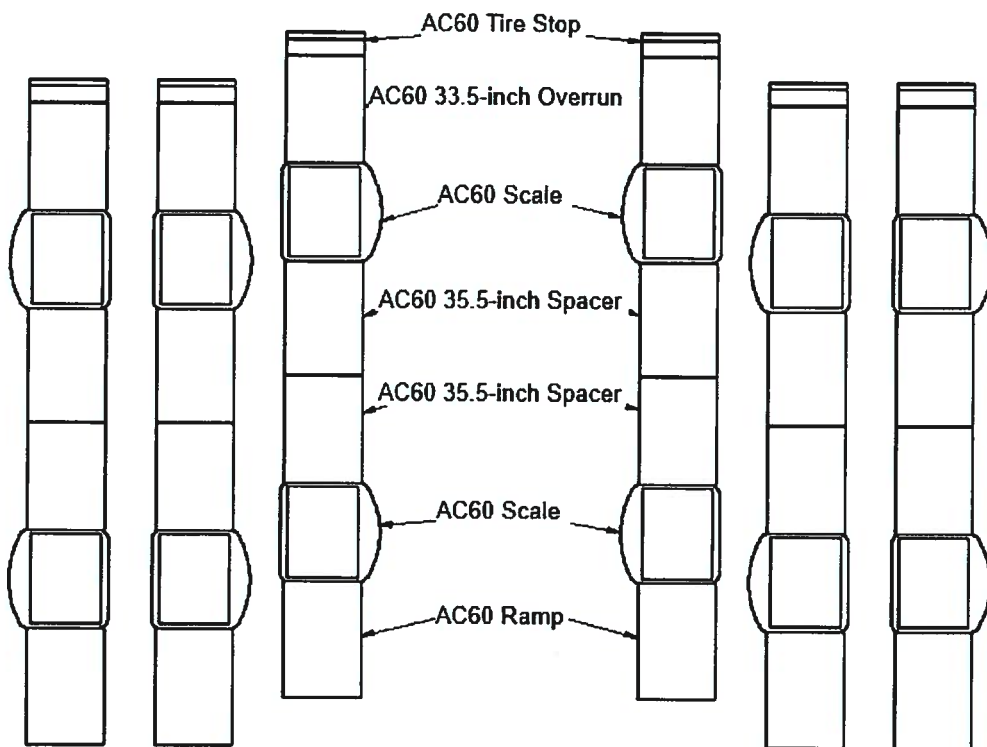
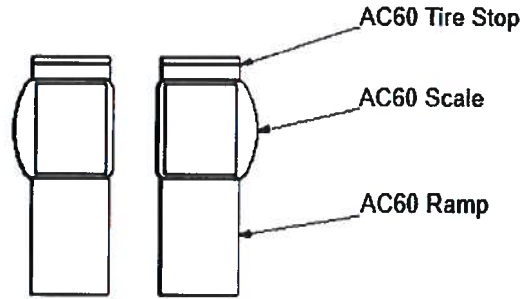
B747-1/2/3/400 & B747-9/10



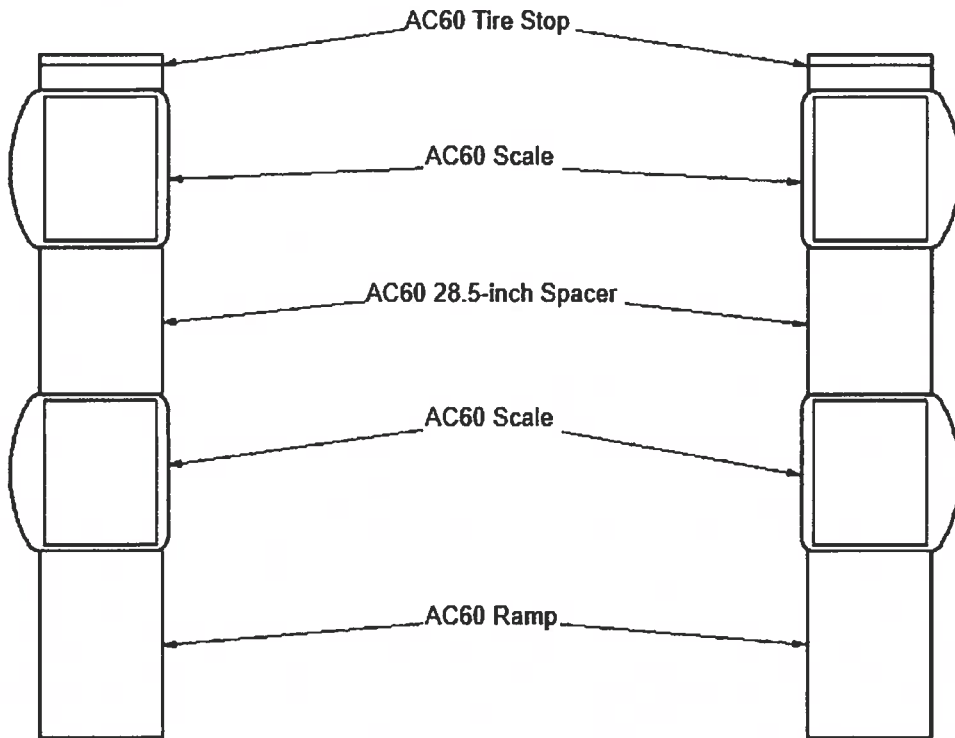
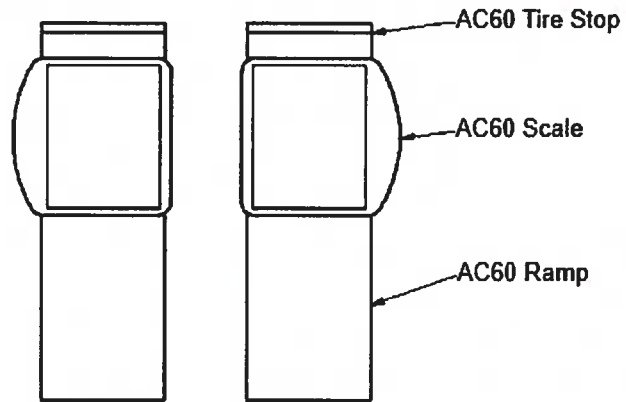
B747-8 & B747-SP



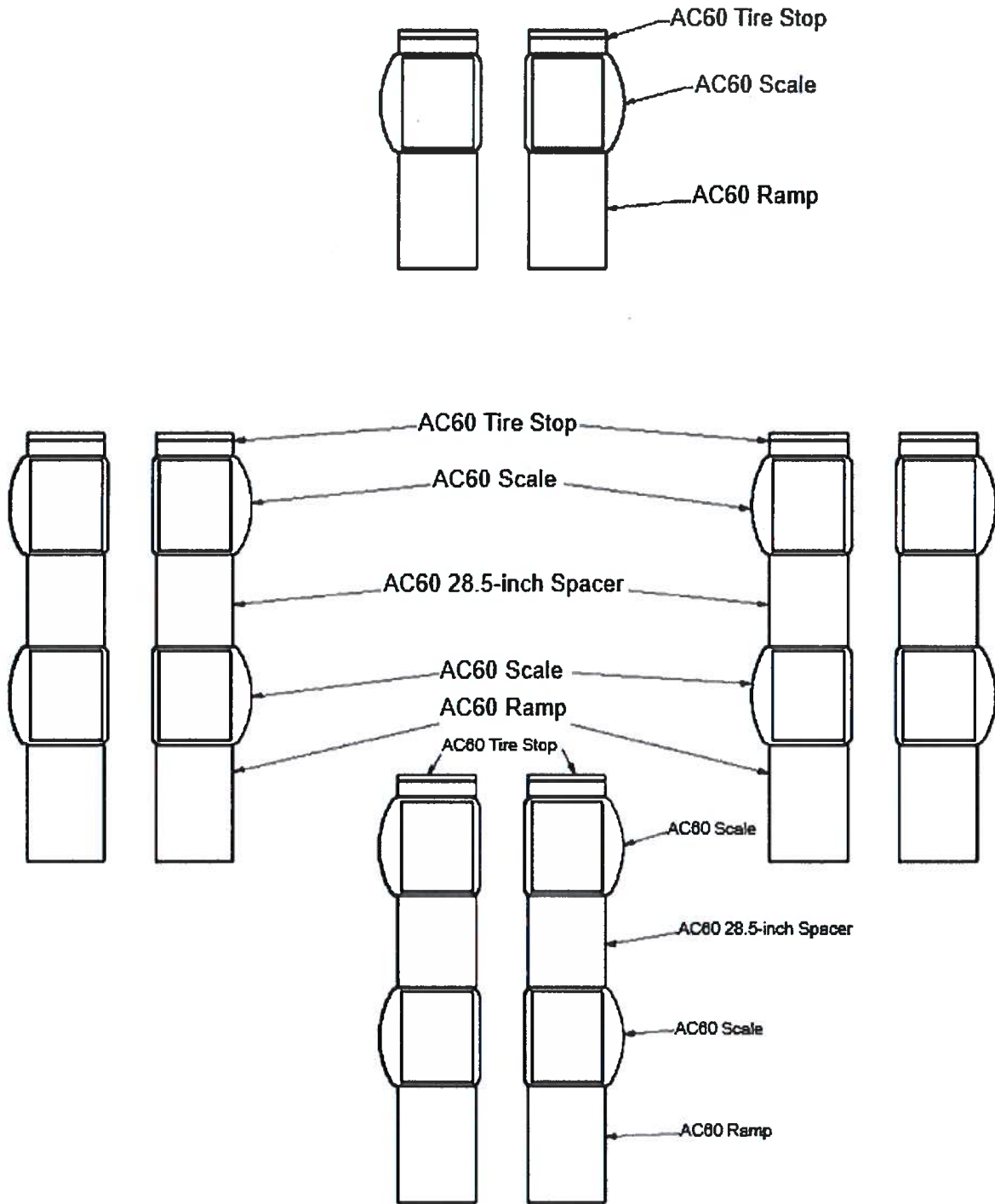
C-17



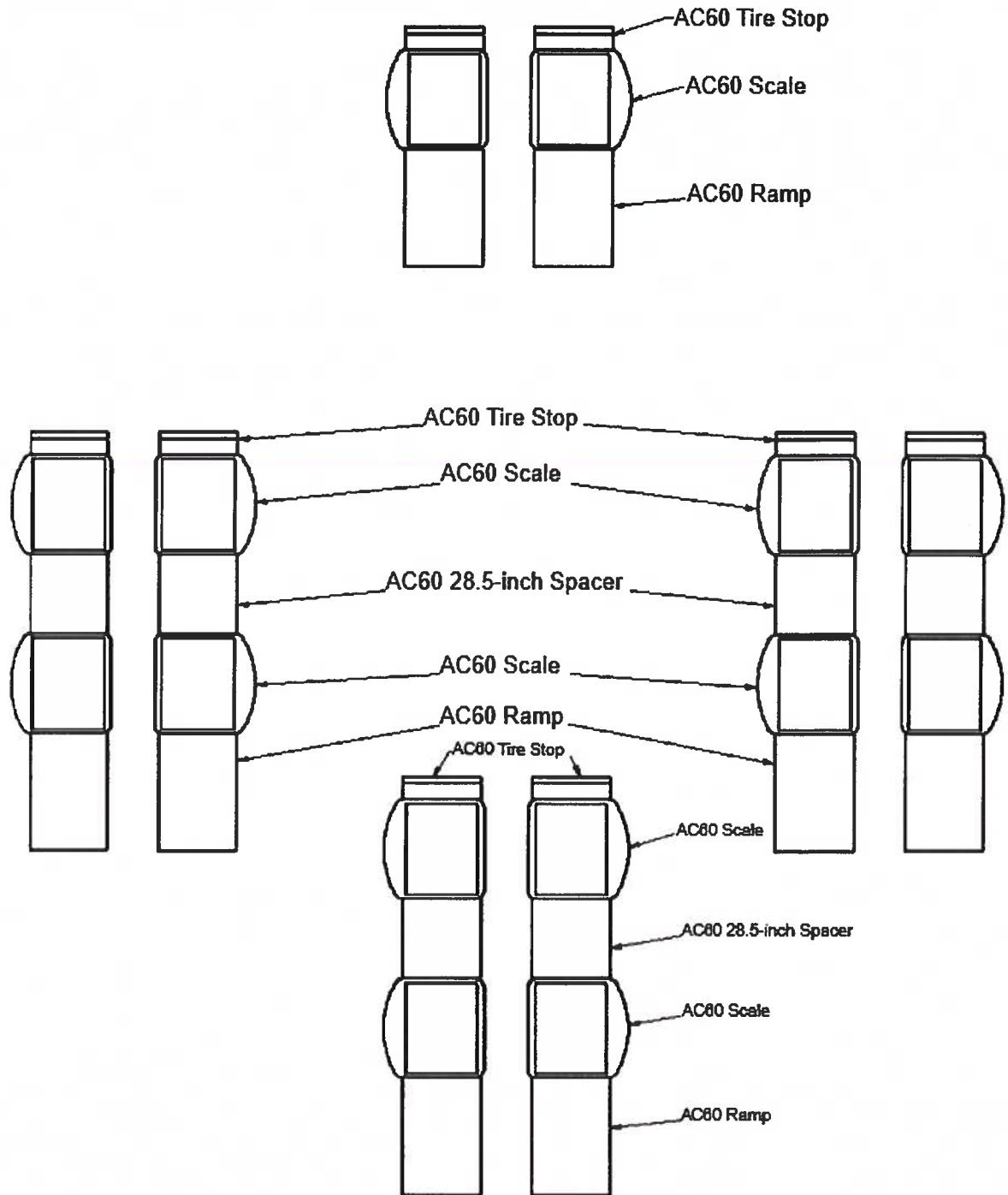
C130



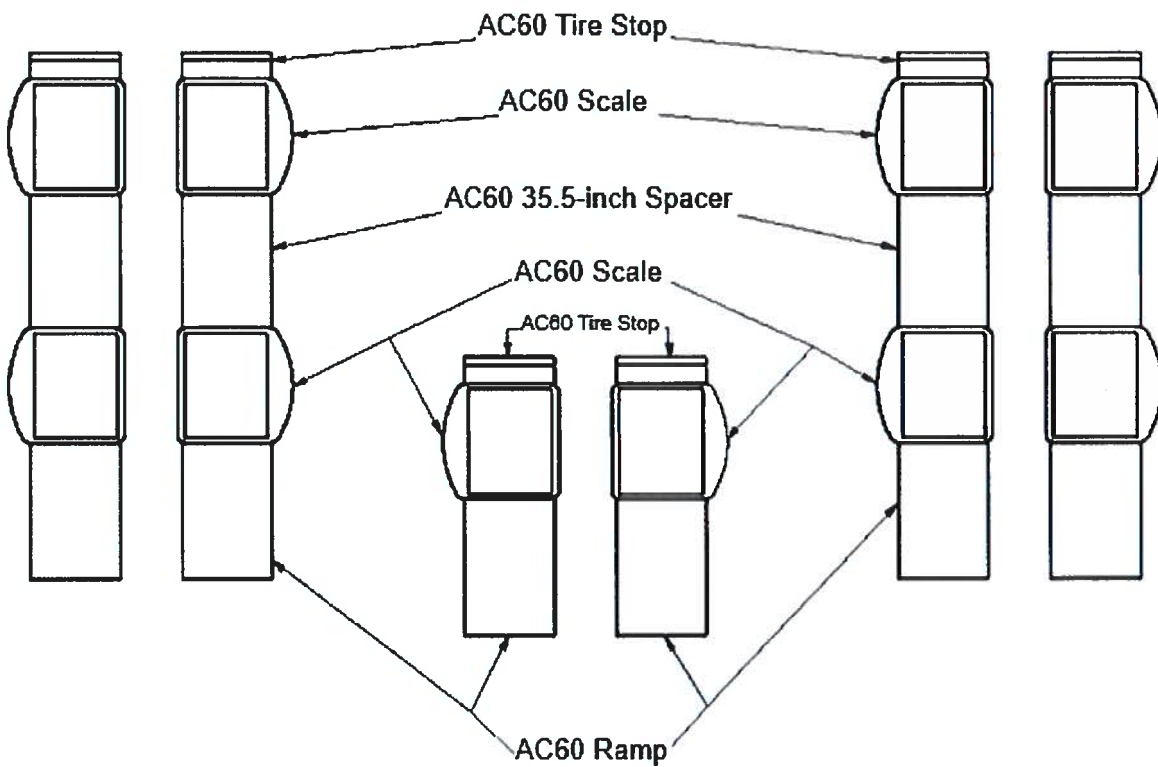
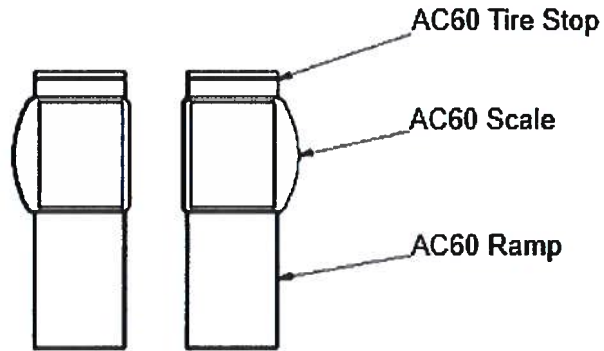
IL-86



IL-96



MD-11



TU-154

