7166 Electric Helm

Owner's Operation, Installation & Maintenance Manual



NOTES:

RECORD DATA BEFORE INSTALLATION FOR FUTURE REFERENCE	
Model #:	
Serial #:	
Date of Purchase:	
Date of Installation:	

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1 INTRODUCTION

1.1 CONTACT

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This document is intended to clearly present comprehensive product data and provide technical information to assist the end user in design applications. Kobelt reserves the right, without notice, to change the design, or construction, of any products and to discontinue or limit distribution of any products. Kobelt also reserves the right to change, or update, without notice, any technical information contained within this document.

Kobelt recommends that customers visit our website to check for updates to this Manual. Once a product has been selected for use, it should be tested by the user to ensure proper function in all possible applications. For further instructions, please contact our distributors or visit our website.

1.2 COMPLIANT USE

This device is only intended for use by persons trained in operating marine systems.

The installer shall:

- Only use non-defective products.
- Check the safety of operation and the condition of the device before each use.
- Verify that the product is operational at all times and keep it in good working conditions.

Only Kobelt Manufacturing Co. Ltd. Authorized Dealers or Authorized Technicians are to repair Kobelt products.

1.3 COPYRIGHTS & TRADEMARKS

All product names, logos and brands are property of their respective owners. All company, product and service names used in this manual are for identification purposes only. Use of these names, logos, and brands does not imply endorsement.

2 SAFETY

2.1 SAFETY ALERTS

Throughout this manual, the following symbols, and their accompanying explanation, are used to alert the user to special instructions concerning a service or operation that may be hazardous if performed incorrectly or carelessly. The associated risk levels are stated below.

⚠ DANGER	This symbol indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
⚠ WARNING	This symbol indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	This symbol indicates a hazardous situation, which if not avoided, could result in minor or moderate injury.
NOTICE	This symbol informs the reader of events not related to personal injury but which there is a risk of damage to property or equipment.
SAFETY INSTRUCTIONS	This symbol informs the reader of safety-related instructions or procedures.

2.2 NOTICE TO INSTALLER

Disregarding the following safety measures can result in an accident-causing severe injury to personnel and damage to material assets.

- Only use the product as directed in this manual.
- Never put the product into service if there is evidence of visible damage.
- Never put the product into service before fully completing installation and commissioning.
- Do not make any modifications to the product.
- Only use authentic Kobelt spare parts.
- Observe all local regulations, directives, and laws during the installation of this product.
- All installation, commissioning, and maintenance work must only be conducted by qualified personnel. (For the purpose of this manual, qualified personnel are people who are familiar with the assembly, installation, commissioning, and operation of the product and who have the qualifications necessary for their occupation.)
- Observe all specifications in this manual. If these guidelines are not followed and damage occurs, the warranty will be voided.

2.3 PRODUCT HAZARDS

⚠WARNING	**Pinch Points:** The 7166 helm contains pinch points, which can cause bodily harm. Ensure that hands and fingers remain clear of the pinch points when performing work.

⚠WARNING	**Equipment Starts Automatically:** Equipment may activate suddenly while servicing this product, causing bodily harm. Ensure that all power sources are locked out prior to performing work.

⚠CAUTION	**Voltage and Current Compatibility:** Confirm that the power source is compatible with the maximum voltage and current ratings of this product variant, including the potentiometer ratings. Failure to do so could result in damage or fire.

3 PRODUCT DESCRIPTION

The Kobelt 7166 electric helm is used as an input to Full Follow Up (FFU) electronic steering systems. The operator can maneuver the vessel by moving the helm wheel port or starboard to operate its internal potentiometer. The helm allows 2-2/3 turns from hard-over to hard-over and is equipped with a single potentiometer. The shaft is machined with a standard ¾" taper.

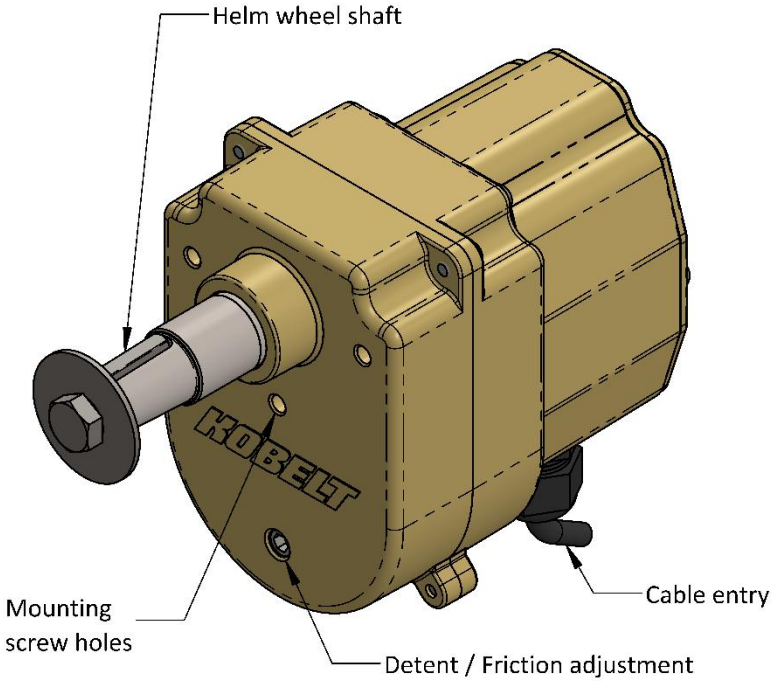


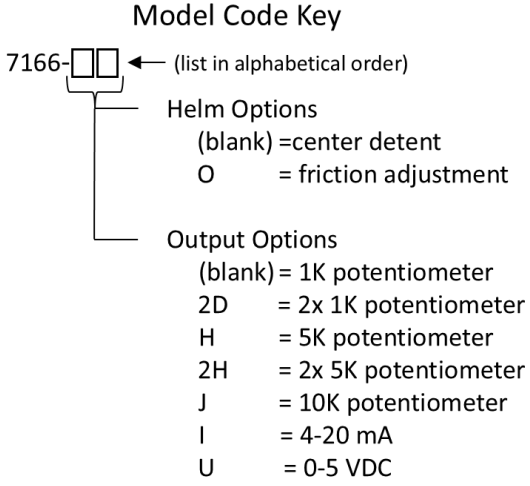
Figure 1: 7195 Overview Diagram

3.1 TECHNICAL DATA

Table 1: 7166 Technical Data

MODEL	7166	7166-H
KOBELT PART #	7166	7166-H
HELM WHEEL TRAVEL	1-1/3 turns (per direction)	
POTENTIOMETER VALUE	1kΩ	5kΩ
MAX. POTENTIOMETER POWER	1 W	1 W
OPERATING TEMPERATURE	-25°C to 70°C [-13°F to 158°F]	
PRODUCT WEIGHT	2.5 kg [55 lbs]	
SURFACE FINISH	Plain bronze	

3.2 MODEL CODE KEY



4 INSTALLATION

4.1 MECHANICAL

The electric helm must be mounted on a flat surface and stiff enough to withstand the operating forces imposed during normal use without excessive flexing. Use the template at the back of this manual to make the correct cut-out on the mounting surface.

Ideally, the Compact Electronic Helm should be mounted in a central location at each station on-board the vessel to control steering operation.

- Within 6 feet [1.5 m] of electrical junction box.
- Placed appropriately to ensure clearance for wheel attachment and operator.
- Placed as to protect external electrical cable from damage.
- The wheel to be used with this helm should be limited to a maximum of 18 inches (450 mm) for optimum performance.

NOTICE	Do **NOT** use a wheel over 18" (450 mm) in diameter with this Electronic Helm. An oversized steering wheel can damage this unit causing the steering input to become inoperable.

The control head is equipped with (3) three 1/4UNC tapped holes for direct mounting to the dash. Ensure the unit is securely fastened, preferable with an anaerobic thread locker such as Loctite 243.

4.2 ELECTRICAL

The Compact Electronic Helm with a single potentiometer is supplied with a 1 m long 18/3C cable for external connections. The version with dual potentiometers is supplied with a 1 m long 18/7C cable for connection to an electrical junction box and the electronic or power-hydraulic steering system interface.

The potentiometer is accessible by removing two screws on the rear cover with a Phillip's head screwdriver. The product's terminals contain the following connections and related functions:

Table 2: 7166 Top Handle Terminal Block Connections

Terminal	Signal Name	Colour	Function
1	POT1+	White	Potentiometer 1 power supply connection.
2	POT1 WIPER	Red	Potentiometer 1 signal connection.
3	POT1-	Black	Potentiometer 1 ground supply connection.
1	POT2+	Brown	Potentiometer 2 power supply connection.
2	POT2 WIPER	Green	Potentiometer 2 signal connection.
3	POT2-	Blue	Potentiometer 2 ground supply connection.

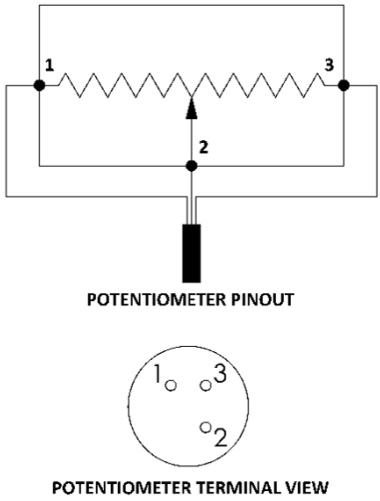


Figure 2: 7166 Internal Wiring and Connection Diagram

The operating direction of the potentiometers in relation to the helm wheel is shown below in Figure 3.

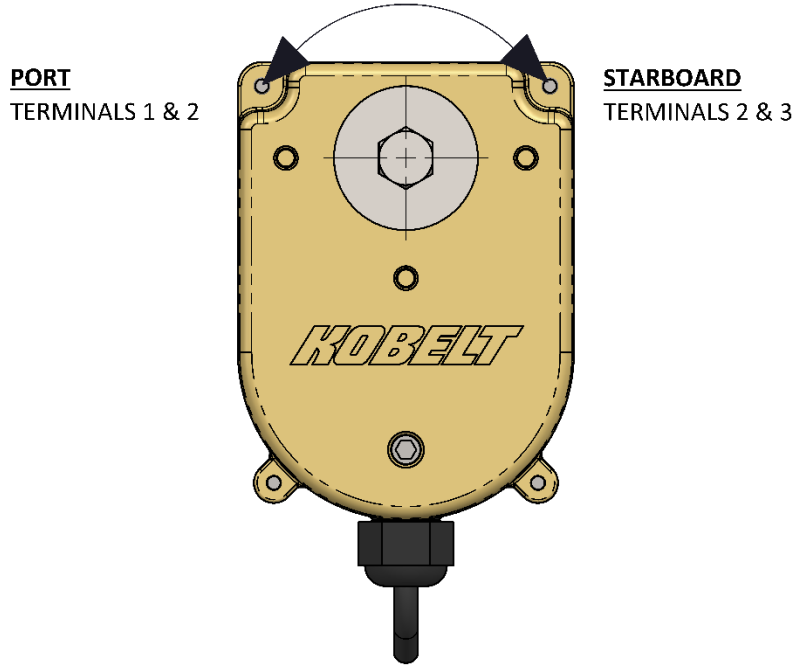


Figure 3: 7166 Potentiometer Direction Diagram

4.3 COMMISSIONING

⚠CAUTION	Ensure that the rear cover is installed and secured before powering on the 7166.

- Confirm that the electrical connections to the 7166 have been made.

⚠CAUTION	The Functional Test should be carried out while the vessel is still at dock and before it is taken out to sea after installation has been completed.

A complete functional test should be performed on the system that the helm has been installed within before entering operational use.

5 MAINTENANCE

5.1 PREVENTATIVE MAINTENANCE

- Quarterly (4 times per year)
  - Visually inspect wire and cable insulation for splits or damage.
  - Ensure there is no visible corrosion on the unit.
- Biennially (Once every 2 years)
  - Lubricate the detent track
  - Lubricate the gear teeth
  - Confirm all electrical screw terminals are secured.

5.2 LUBRICATION

The track the detent runs along on the detent plate must be lubricated to prevent premature wear. Use a grease with MoS_2 additives for best results. The following greases are approved:

Table 3: Approved Lubricants

EP Grease Brand
CHEVRON DELO MOLY 5% EP2
MOBIL XHP-322
SHELL S3 V460

5.3 RECOMMENDED SPARE PARTS

No spare parts are recommended for this unit due to the sealed nature of its design.

When purchasing replacement parts refer to Appendix B: Parts List at the back of this manual for Kobelt component Part Numbers.

NOTICE	It is recommended that any required service work on a Kobelt unit be performed by a factory authorized service representative. Please contact the nearest Kobelt authorized distributor for assistance.

6 TROUBLESHOOTING

If you encounter problems with the operation of your product, please refer to the trouble-shooting suggestions before contacting Kobelt for assistance. If the steps below do not resolve your issue, please reach out either Kobelt directly or our Dealers in your area.

Table 4: Common Solutions

Problem (Issue encountered)	Cause (What it means)	Corrective Action (What to do)
Helm action is reversed.	Wiring is backwards.	Swap the POT+ and POT- output wires to their respective system and handle connections.
Helm does not move rudder at all.	The rest of the system isn't hooked up correctly.	Check system wiring. Confirm wiring to Stacked FFU Lever.
	Broken potentiometer or contact.	Use a multi-meter to monitor the resistance of the wiring between potentiometer contacts. Check for normal operation of the potentiometer by measuring the connection while moving the Stacked FFU Lever. Check potentiometer directions. Replace any damaged potentiometers.
	Wiring is wrong.	Check wiring. Refer to system design drawing for proper wiring.

7 WARRANTY

Kobelt Manufacturing Co. Ltd. (“Kobelt”) warrants the Products and Parts manufactured by Kobelt to be free from defects in workmanship or material and that said products are designed mechanically and functionally to perform to specifications.

This warranty is effective providing:

- The equipment is used within the intended operating conditions and in accordance with Kobelt recommendations
- The equipment is installed according to equipment diagrams, specifications and recommendations which Kobelt has provided

This warranty becomes invalid if the factory supplied serial number has been removed or altered on the product. This warranty does not cover cosmetic damage or damage caused by an act of God, accident, misuse, abuse, negligence or modification of any part of the product. This warranty does not cover damage due to improper operation or maintenance, connection to inappropriate equipment or attempted repair by anyone other than an authorized Kobelt representative.

Upon identification of a potential issue or defect with a Kobelt Product or Part, the Warranty Applicant (“Applicant”) must immediately contact Kobelt and describe the issue in writing, by letter, fax, email or other electronic conveyance. Kobelt will then assess the cause of the defect and determine warranty applicability and appropriate remediation.

If any part is found to be defective, Kobelt will replace said part FOB the Kobelt factory provided that any such defective part is returned by the Buyer with freight and applicable forwarding charges prepaid by the Buyer. Kobelt’s sole obligation to the Applicant will be to repair or replace the defective part with same or similar product, to a maximum value of the list price of the product or part. The Kobelt warranty does not cover labour charges, travel or any other associated expenses.

All Products and Parts manufactured by Kobelt, are subject to a warranty against manufacturer’s defects in materials or workmanship for a period of two (2) years from the date of purchase.

Kobelt will be responsible for all Products or Parts sold by Kobelt but manufactured by 3rd party manufacturing companies. However, these products and parts are subject to applicable 3rd party warranties and may not be the same as the Kobelt warranty.

8 MANUAL REVISIONS HISTORY

Table 5: Table of revision history

Document Revision	CO	Release Date	Author	Revision Summary
C	-	2023-12-27	SV	• Changed the wire in potentiometer to shielded type (from Green to Red) P10 Cable part number changed from (6014-0001 to 6525W-CT-RL) P18
D	01553	2026-11-05	MW	• Revised model code key (pg. 8) • Added 7166-PP connection details (pg.10) • Added 7166-PP parts list and BOM (pg. 19,20)

9 APPENDIX A: INSTALLATION DIMENSIONS

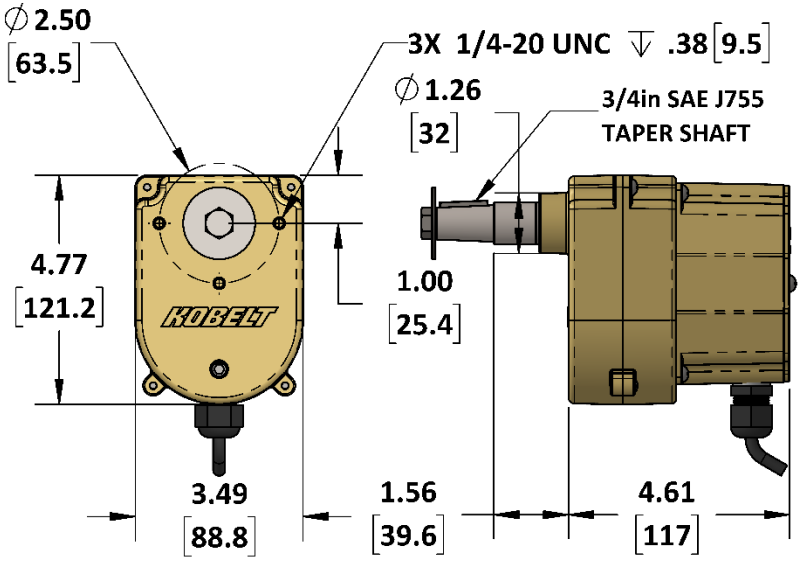


Figure 4: 7166 Installation Dimensions

10 APPENDIX B: PARTS LIST

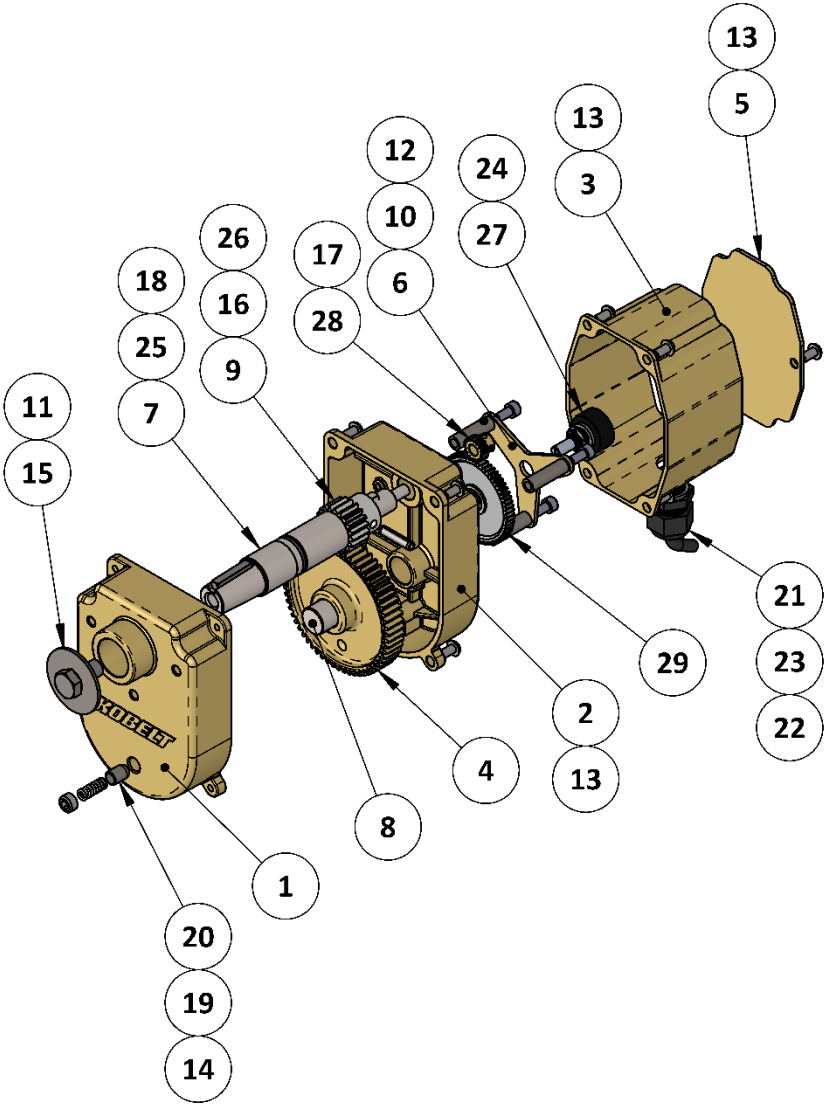


Figure 5: 7166-P Parts Diagram

Table 6: 7166-P Parts List

Model Series:			7166
ITEM	**QTY**	**PART NUMBER**	**DESCRIPTION**
1	1	7166-0001	FRONT COVER; ELECTRIC HELM
2	1	7166-0002	REAR HOUSING
3	1	7166-0003	POTENTIOMETER COVER
4	1	7166-0005	SPUR GEAR 60T
5	1	7166-0004	COVER
6	1	7166-0006	BRACKET
7	1	7166-0007	SHAFT (SHORT)
8	1	7166-0008	SHAFT; 5/8 DIA X 2 LG, AISI 303
9	1	7166-0010	SPUR GEAR; 20T/20DP, STYLE B, 1/2IN BORE
10	3	7174-0008	SPACER, 7172, 1.04IN LG
11	1	1001-1212	SCREW, HX HD, 3/8-16 UNC X 3/4, 18-8
12	3	1002-0824	SCREW, SKT HEAD, 10-24 X 1-1/2, 18-8 SS, ASTM F837
13	10	1010-0806	SCREW, RND HD PHL, 10-24 X 3/8, 18-8
14	1	1016-1204	SET SCREW - SKT; CP PT, 3/8 UNC X 1/4, 18-8
15	1	1023-0245	WASHER, FENDER, 3/8 X 1-1/2, 18-8 SS
16	1	1024-0814	SPRING PIN; 3/16 DIA X 7/8 LG, 18-8
17	2	1041-700601	SET SCREW - SKT; CP PT, #6-32 X 1/8, ALLOY, BO, ASME B18.3
18	1	1101-0018	O-RING 3/4 ID X 1/16 NBR70
19	1	1201-0062	SPRING, DETENT
20	1	2012-0007	DETENT PLUG
21	1	6001-0248	CABLE GLAND; M16 X 1.5, .197-.394 CABLE, PA6, BLACK
22	1	6001-0248-W-M16	WASHER, SEALING, M16, POLYETHYLENE
23	1	6525W-CT-RL	CABLE; 3C/18AWG / SHLD / 600V / 105C / GRY
24	1	6639-0001	WASHER, FLAT, 10MM X 2MM, AISI 304
25	1	7005-0020	KEY; 3/16 IN SQR X 1 LG, CLASS 1 FIT, 18-8
26	1	7166-0013	KEY; 3/16IN SQR X .58 LG, CLASS 1 FIT, 18-8
27	1	POT-1	POTENTIOMETER, 1K, 1TURN, 340 DEG, 22MM DIA
28	1	Y-3216	SPUR GEAR - BRASS; 16T, 32DP, 1/4 BORE, B STYLE
29	1	YPB-3264-1	SPUR GEAR - DELRIN; 64T, 32DP, 1/4 BORE BUSHING, B STYLE

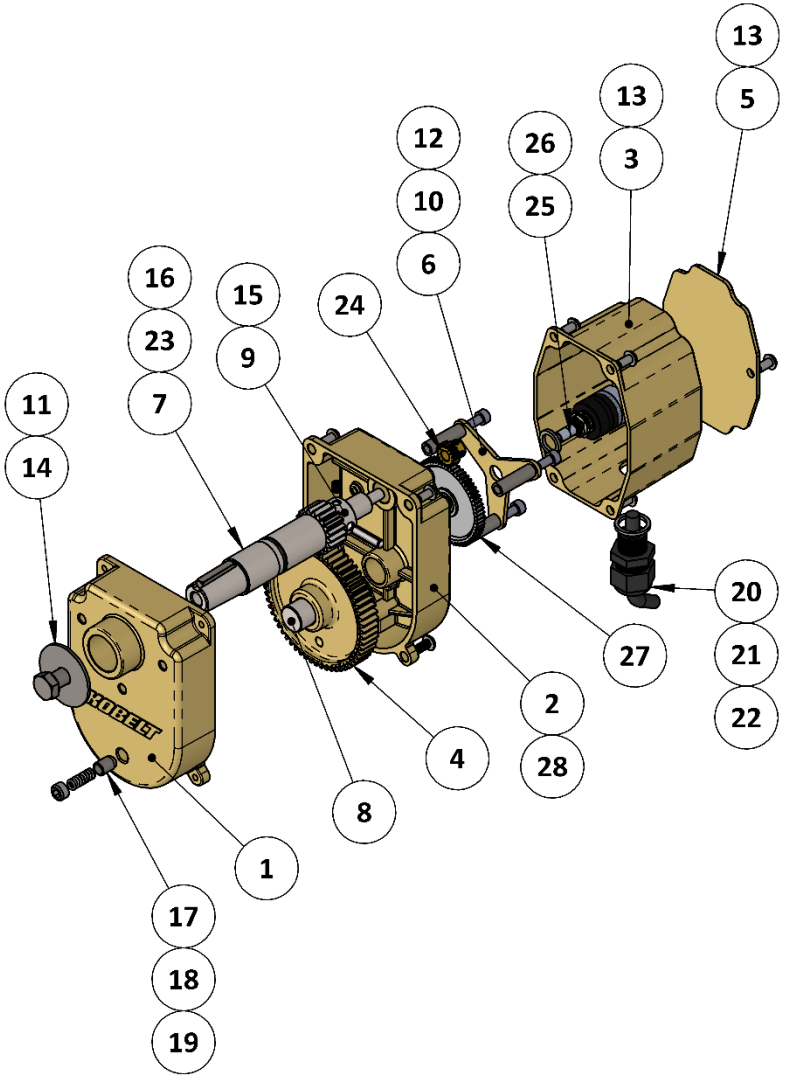


Figure 6: 7166-PP Parts Diagram

Table 7: 7166-PP Parts List

Model Series:			7166
ITEM	QTY.	PART NUMBER	DESCRIPTION
1	1	7166-0001	FRONT COVER; ELECTRIC HELM
2	1	7166-0002	REAR HOUSING
3	1	7166-0003	POTENTIOMETER COVER
4	1	7166-0005	SPUR GEAR; 60T, 20DP, B-STYLE
5	1	7166-0004	COVER
6	1	7166-0006	BRACKET
7	1	7166-0007	SHAFT (SHORT)
8	1	7166-0008	SHAFT; 5/8 DIA X 2 LG, AISI 303
9	1	7166-0010	SPUR GEAR; 20T/20DP, STYLE B, 1/2IN BORE
10	3	7174-0008	SPACER, 7172, 1.04IN LG
11	1	1001-1212	SCREW, HX HD, 3/8-16 UNC X 3/4, 18-8
12	3	1002-0824	SCREW, SKT HEAD, 10-24 X 1-1/2, 18-8 SS, ASTM F837
13	8	1010-0806	SCREW, RND HD PHL, 10-24 X 3/8, 18-8 SS
14	1	1023-0245	WASHER, FENDER, 3/8 X 1-1/2, 18-8 SS
15	1	1024-0814	SPRING PIN; 3/16 DIA X 7/8 LG, AISI 420
16	1	1101-0018	O-RING - 2-018; 3/4 ID X 1/16 THK; NBR70
17	1	2012-0007	DETENT PLUG
18	1	1201-0062	COMPRESSION SPRING; .25OD X .05W X .75 FL
19	1	1016-1204	SET SCREW - SKT; CP PT, 3/8 UNC X 1/4, 18-8
20	1	6001-0248	CABLE GLAND; M16 X 1.5, .197-.394 CABLE, PA6, BLACK
21	1	6525W-B-RL	CABLE; 7C/18AWG; SHIELDED; 600V, GRY
22	1	6001-0248-W-M16	WASHER, SEALING, M16, POLYETHYLENE
23	1	7005-0020	KEY; 3/16 IN SQR X 1 LG, CLASS 1 FIT, 18-8
24	1	Y-3216	GEAR 16T, 32DP, 1/4 BORE, 2 SET SCREW
25	1	POT-22	POT 1K0 DUAL 10%TOL 1%LIN 1W 1TURN 340DEG
26	1	6639-0001	SHIM WASHER, 10MM X 2MM, AISI 304
27	1	YPB-3264-1	SPUR GEAR - DELRIN; 64T, 32DP, 1/4 BORE BUSHING, B STYLE
28	2	1010-0808	SCREW, RND HD PHIL, #10-24 X 1/2, 18-8 SS
29	1	6009-7469	HEAT SHRINK 2:1 1/4IN 120C BLK
30	2	6009-6230	CABLE TIE 0.1IN X 4IN 18LB BLACK

11 APPENDIX C: INSTALLATION CUT-OUT TEMPLATE

NOTICE	Scale may not be exactly 1:1 due to PDF and printer scaling. Verify primary dimension with a ruler after printing and before using to cut.

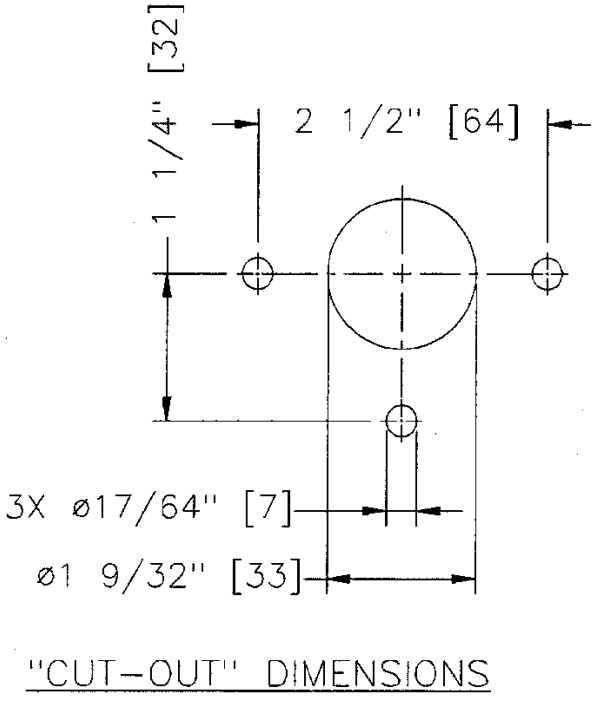


Figure 7: Installation Cut-out Template



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