

© Copyright 1998, Teleflex Incorporated (USA)

**INSTALLER: THESE INSTRUCTIONS CONTAIN IMPORTANT SAFETY INFORMATION AND MUST BE FORWARDED TO THE BOAT OWNER.**

These instructions describe how to install **NO FEEDBACK HELMS** for **PERFORMANCE TILT** steering systems. These helms contain a clutch mechanism to prevent the engine torque from being felt at the steering wheel. This reduces driver fatigue by eliminating constant fighting the wheel. IT **DOES NOT ELIMINATE THE ENGINE TORQUE**, this can only be reduced by proper trim and tilt setting by trial and error when running the boat. Instructions for installing steering cables are also included.

In addition to this kit the following components are required for a complete **PERFORMANCE TILT** system.

- **PERFORMANCE TILT MECHANISM.**
- **STEERING CABLE SSC 62- length** (Two required for dual helm)
- **ENGINE CONNECTION KIT**, see Teleflex catalog.
- **STEERING WHEEL**, (maximum diameter 16 inches.) see Teleflex catalog.

### WARNING

**BEFORE STARTING INSTALLATION READ THESE INSTRUCTIONS AND ENGINE MAKERS INSTRUCTIONS THOROUGHLY. FAILURE TO FOLLOW EITHER OF THESE INSTRUCTIONS OR INCORRECT ASSEMBLY CAN RESULT IN LOSS OF CONTROL AND CAUSE PROPERTY DAMAGE OR INJURY.**

**DO NOT SUBSTITUTE PARTS FROM OTHER MANUFACTURERS, THEY MAY CAUSE A SAFETY HAZARD FOR WHICH TELEFLEX INC., USA CANNOT ACCEPT RESPONSIBILITY. USE TELEFLEX STEERING CABLES ONLY WITH THIS HELM.**

**TO AVOID EXCESSIVE STEERING LOADS, AND TO GET THE BEST STEERING PERFORMANCE, THE OUTBOARD MOTOR OR OUTDRIVE TRIM TABS AND TILT POSITION MUST BE ADJUSTED AS INSTRUCTED IN THE MOTOR MANUFACTURERS OPERATION MANUAL. FAILURE TO DO SO CAN EFFECT THE PERFORMANCE OF THE BOAT AND ITS SAFE OPERATION.**

**DO NOT ATTACH ANY ELECTRICAL GROUND WIRES TO THE HELM. THIS WOULD RESULT IN AN ELECTROLYTIC REACTION TO THE STEERING CABLE THAT MAY RESULT IN CABLE FAILURE OR GREATLY REDUCED SERVICE LIFE.**

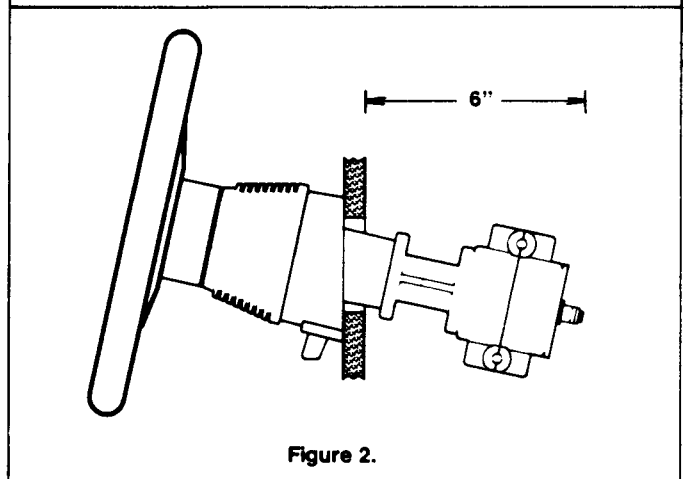
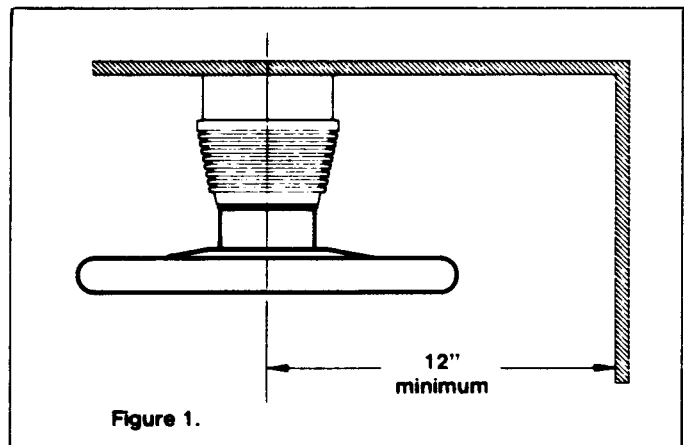
**NOTE:** Helms and cable assemblies are supplied lubricated ready for installation, do not add any lubricant to either assembly. Use of other lubricants can cause damage to the steering cable, resulting in the cable seizing or premature wear. Keep the cable clean during installation. Dirt will damage the system and cause premature wear. Do not take the plastic sleeve off the end of the cable until you are ready to install it into the helm.

### WARNING

**HELMS MUST NOT BE DISASSEMBLED FOR ANY REASON. INCORRECT RE-ASSEMBLY MAY LEAD TO TOTAL FAILURE OF THE SYSTEM WHICH COULD RESULT IN PERSONAL INJURY OR PROPERTY DAMAGE.**

### PREPARATION FOR INSTALLATION

Locate the position for the steering wheel on the console or dashboard. The steering cable can enter the helm from either port or starboard. The dimensions shown in Figures 1 & 2 must be maintained to ensure proper clearances.



Position the template Figure 3, on the console or dashboard, at the location previously marked and drill three holes 5/16 inches diameter and one hole 2-7/8 inches diameter.

### HELM MOUNTING BRACKET INSTALLATION.

Secure the helm mounting bracket (item 3) in position using hex bolts (item 4), large flat washers (item 5) and locknuts (item 6). Tighten securely, see Figure 4.

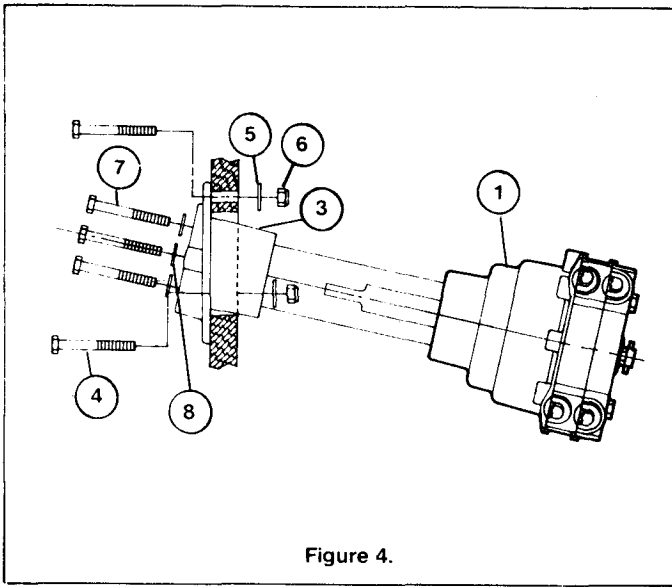


Figure 4.

Before the helm can be attached to the mounting bracket the routing of the steering cable must be determined.

### STEERING CABLE ROUTING

The cables, if possible, should be routed to the starboard side of the boat in order to balance engine torque. When routing the steering cable(s) select a path with the minimum number of bends, making the bends as large as possible. **DO NOT MAKE BENDS LESS THAN 8" RADIUS.** Sharp or frequent bends will result in hard steering and premature cable wear. When necessary to pass through a bulkhead, a 1-1/2" dia. hole is required. Cable(s) should be clamped or tied for support at regular intervals.

#### CAUTION

*CABLE(S) MUST NOT BE BUNDLED WITH ELECTRICAL WIRES. OR REST ON SHARP EDGES WHICH COULD CAUSE CHAFING.*

### HELM INSTALLATION

Insert the shaft of the helm (item 1) through the hole in the mounting bracket orienting it in the proper direction for the steering cable entry. Attach the helm securely to the mounting bracket using hex bolts (item 7) and washers (item 8) threaded into the helm. See Figure 4.

**At this time refer to the instructions packed with the tilt mechanism hardware kit and install the tilt mechanism and the steering wheel.**

### STEERING CABLE INSTALLATION.

Before the steering cable is installed the steering wheel should be positioned as shown in Figure 5. This will position the wheel so that it is in the correct orientation when the installation is completed.

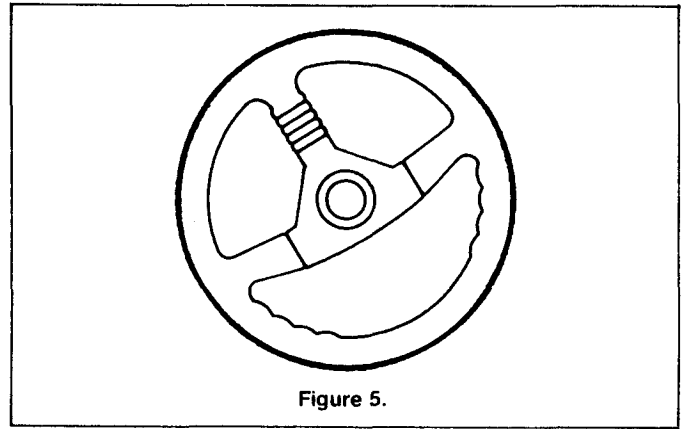


Figure 5.

### SINGLE HELM

**Step 1.** Remove the protective sleeve from the Steering cable, making sure that dirt does not get onto the lubricated cable end.

**STEP 2.** Feed cable end into the **UPPER** Helm entry spigot until it contacts the internal gear, ~~then turn the steering wheel to draw the cable fully into the helm,~~ (see figure 6). Continue turning the steering wheel until the end fitting of the cable is fully inserted into the entry spigot.

**STEP 3.** Insert two bolts (item 9) into the helm and tighten fully, making sure that the bolts are in the retaining groove of the cable fitting. See figure 6.

**STEP 4.** Feed the Spent Travel Tube (item 2) over the exposed cable end and insert bolt (item 9) into the helm, tighten fully. See Figure 6.

**STEP 5.** Rotate the steering wheel several times from stop to stop, and watch the movement of the Steering Cable output ram. On Starboard mounted helms turning the wheel clockwise should cause the ram to extend. On port mounted helms the ram should retract.

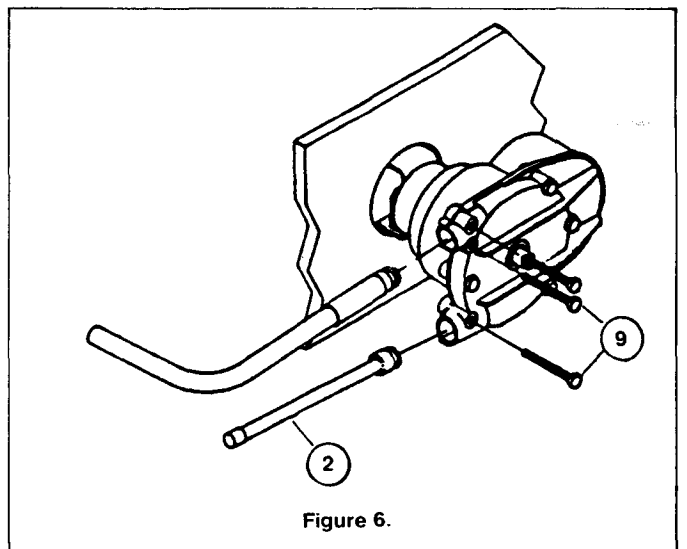


Figure 6.

PARTS LIST			
Item	Description	Single	Dual
1	Helm	1	1
2	Spent Travel Tube	1	1
3	Helm Mounting Plate	1	1
4	Hex Bolt $\frac{1}{4} \times 2\frac{1}{8}$	3	3
5	Large Washer	3	3
6	Lock Nut	3	3
7	Hex Bolt $\frac{1}{4} \times 2\frac{3}{4}$	3	3
8	Washer	3	3
9	Hex Bolt $\frac{1}{4} \times 1\frac{1}{2}$	3	
10	Hex Bolt $\frac{1}{4} \times 2\frac{1}{4}$		3

## OPERATION AND MAINTENANCE NOTES

### CAUTION

*IT IS POSSIBLE TO OVERTRIM THE ENGINE AND INCREASE THE STEERING TORQUE TO THE POINT THAT THE STEERING CANNOT BE TURNED, EVEN THOUGH THE TORQUE IS NOT FELT AT THE WHEEL. THIS MAY GIVE THE IMPRESSION THAT THE STEERING IS "LOCKED". THIS CONDITION CAN OCCUR MORE WHEN JACK PLATES ARE USED TO RAISE THE ENGINE ON THE TRANSOM, AND CAN ONLY BE OVERCOME BY REDUCING THE ENGINE TRIM OUT POSITION. UNTIL YOU ARE COMPLETELY FAMILIAR WITH THE BOAT AND THE EFFECTS OF POWER TRIM, MAKE ALL ADJUSTMENTS OF TRIM WITH EXTREME CAUTION.*

1. After a few hours of operation and at frequent intervals thereafter, check all fasteners and the complete steering system for security and integrity.

**DANGER**

**LOOSENING OR LOSS OF ONE OR MORE FASTENERS MAY CAUSE FAILURE OF THE STEERING SYSTEM, RESULTING IN LOSS OF STEERING CONTROL AND COULD CAUSE PERSONAL INJURY OR PROPERTY DAMAGE.**

2. Keep all moving parts free from build-up of salt and other foreign material. This will affect their operation and create steering problems. Pay particular attention to the hinge tube of outboard motors. Periodically remove the cable, clean the hinge tube thoroughly and lubricate with a waterproof grease.

3. Inspect periodically for corrosion. Any parts affected by corrosion must be replaced. When replacing hardware, self locking hardware **MUST** be used.

4. Inspect steering cable periodically for cracks or other damage. If any are found the cable must be replaced.

**DANGER**

**DO NOT COVER CRACKS WITH TAPE OR OTHER SEALANTS. THIS WILL CREATE A HAZARD IN WHICH THE CABLE CAN FAIL SUDDENLY WITHOUT WARNING.**

KEEP THESE INSTRUCTIONS WITH YOUR BOAT FOR FUTURE REFERENCE.

## CONNECTION TO ENGINE.

For engine-mounted steering systems, slide the output ram through the engine support tube. Thread the Cable Coupler nut onto the support tube. **NOTE:** The Coupler Nut has a locking ring in the threads. Make sure the Nut is drawn up fully and the locking ring is engaged. If you do not tighten this nut fully there will be excessive play in the steering system. Connect the output ram to the engine tiller arm as shown in the instructions packed with the connection kit.

### CAUTION

**ENSURE THAT THE CABLE OUTPUT END IS NOT BENT WHEN INSTALLING. IF NECESSARY REMOVE THE ENGINE FROM THE BOAT.**

For a boat-mounted steering system, attach the cable to the boat and engine in accordance with instructions furnished with the connection kit.

## DUAL HELM.

**STEP 1.** Push both output rams of the cables to the fully retracted position. Make sure that they stay fully retracted during installation into the helm. Remove the protective sleeves from Steering Cables, make sure that dirt does not get onto the lubricated cable ends. Hold both cables together at the helm end with the faces of the conduit fittings flush, as shown in Figure 7.

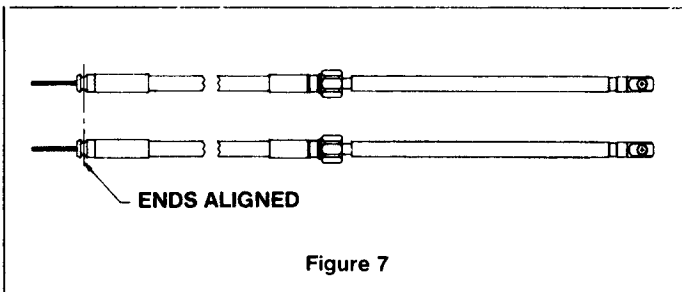


Figure 7

**STEP 2.** Feed the cable ends into the UPPER entry spigots, keeping the conduit fittings aligned, until they contact the internal gears. Then turn the steering wheel to draw the cables fully into the helm. Continue turning the wheel until both conduit end fittings are fully inserted into the entry spigots. See Figure 8.

**STEP 3.** Insert two bolts (item 10) into the helm and tighten fully, making sure that the bolts are in the retaining grooves of both cables fittings. See Figure 8.

**STEP 4.** Feed the Spent Travel Tubes (item 2) over the exposed cable ends and insert bolt (item 10) into the helm, tighten fully. See Figure 8.

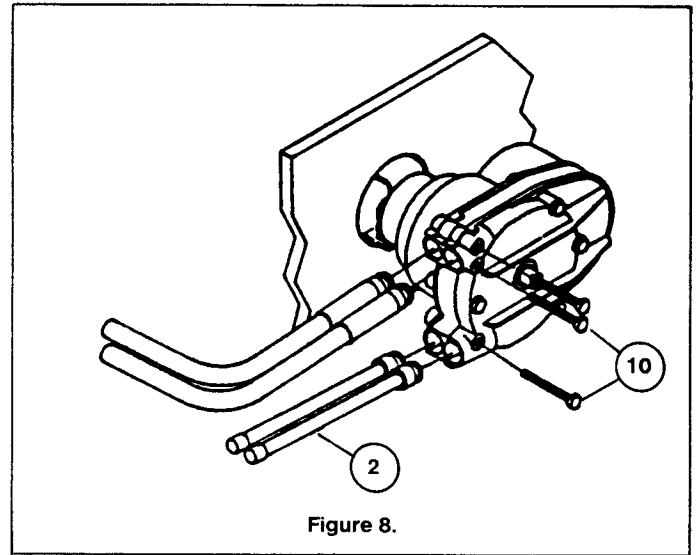


Figure 8.

**STEP 5.** Rotate the steering wheel several times from stop to stop, and watch the movement of the Steering Cable output rams. On Starboard mounted helms turning the wheel clockwise should cause the rams to extend. On Port mounted helms turning the wheel clockwise should cause the rams to retract.

## CONNECTION TO ENGINE.

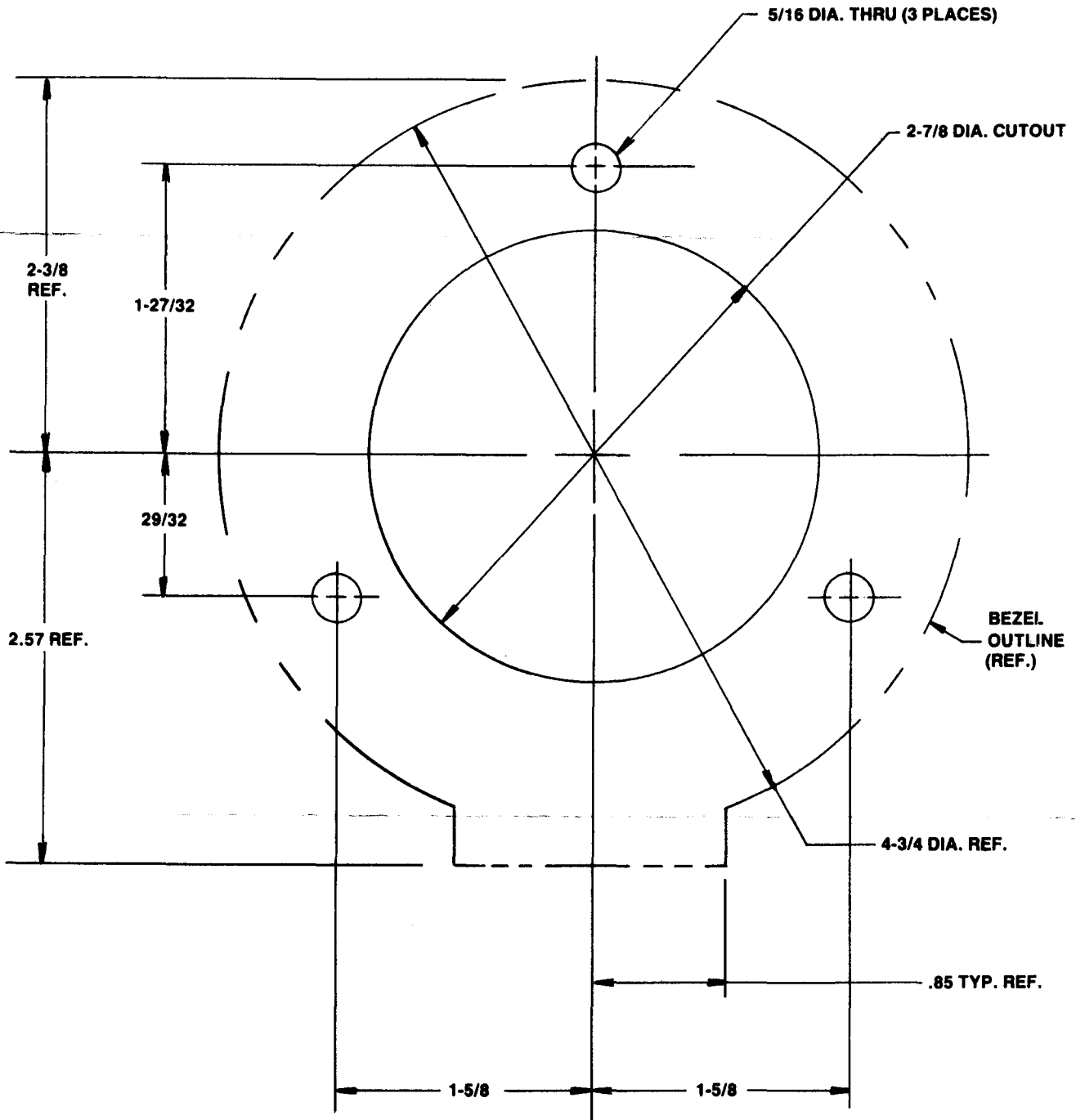
The steering cables can now be connected to the engine, using a connection kit available from the engine maker or an approved equivalent. The adjustment of dual cable connection kits is critical for smooth easy steering. The instructions provided by the kit maker **MUST** be followed.

### CAUTION

**ENSURE THAT THE CABLE OUTPUT ENDS ARE NOT BENT WHEN INSTALLING. IF NECESSARY REMOVE THE ENGINE FROM THE BOAT.**

Adjustment of the connection kit is critical to the operation of this system. If the instructions are not followed exactly the steering will be heavy and could be subject to accelerated wear. Adjustments must be made and tested with the boat under operating conditions. To fine tune the steering, install the connection kit without adjusting the second cable tube. Turn the steering wheel so that you get a feel of the load to move the engine. Move the engine from side to side and check the amount of free play in the cables. Adjust the connection kit tube until as much of the free play is removed as possible **WITHOUT INCREASING THE LOAD AT THE STEERING WHEEL.** There may be a small amount of free play at the steering wheel, this is normal and cannot be removed by adjusting the connection kit. Tighten both adjusting nuts and test drive the boat. Readjust the connection kit if necessary.

SH915XX SERIES PERFORMANCE TILT SYSTEM



TEMPLATE

Figure 3.