WR CONTROLS
FLEXBALL ITALIANA

INSTALLATION MANUAL

Lever Controls 3200 series

- 3200.1 SINGLE
- 3200.2 TWIN

Flexball Italiana Srl

INSTALLATION MANUAL

for 3200.1 Single, 3200.2 Twin Controls

1.1 DESCRIPTION AND OPERATION

1.1.1 GENERAL

The 3200.1 Single lever and 3200.2 Twin lever control boxes allow combined operation of both throttle and shift for single or twin engines either outboard or inboard-outboard or inboard configuration.

FLEXBALL E2 or E3, ULTRAFLEX C2 or C8 and Morse 33C push-pull cables are available for the control box / power plant connection.

1.1.2 DESCRIPTIVE DATA

The 3200.1 and 3200.2 control boxes provide the following standard features:

- Double action lever(s) (throttle/shift control)
- Throttle control with shift at neutral
- Starting in gear prevention through a neutral safety switch **(option)**
- Adjustable shift control stroke.

1.1.3 MAINTENANCE AND CORROSION PROTECTION

For maximum protection especially in a salt water environment, the control head and head lever should be washed with fresh water and waxed on a regular basis.
Periodically check the control head mechanism for loose fasteners and signs of wear on moving parts.
Keep these moving parts well lubricated with a moisture-displacing lubricant.
Periodically check the cables and engine connections for signs of wear and corrosion. Replace as necessary.

1.2 INSTALLATION

1.2.1 LOCATING THE CONTROL BOX

Before installation be sure the control box location allows:

- Complete and free turning of the hand lever from the **full forward to the full reverse** position.
- Cable routing with long radius bends.

Refer to Fig. 1 for control box dimensions and minimum required clearances.
After determining a proper location refer to Fig. 8 for the Single and to Fig. 9 for dual control mounting templates.

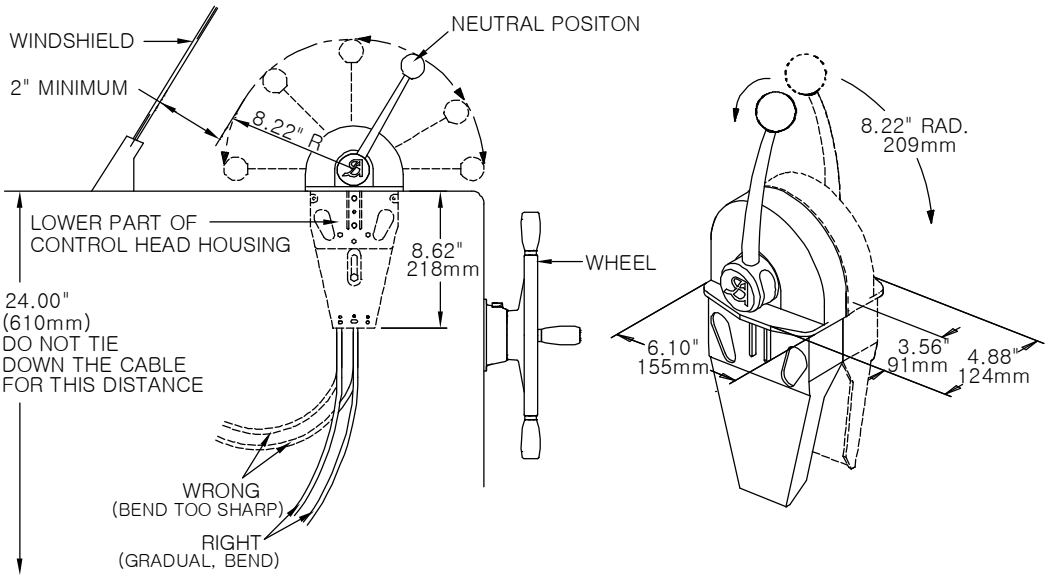
1.2.2 FITTING THE CABLES

Route and measure the cable for the length from the control head to the power plant through a straight and free of obstacles run.
Cable bending should be reduced as much as possible. Long radius bends should be used when possible and no bends with a radius of less than 8 inches(203mm) should be used.

The cables can be sustained by means of suitable cable hangers or routed through segments of conduit for long straight runs.
Do not use fittings that may compress the cable casing.

Outboard power plant installations require an additional 4-feet length (1200mm) of the cables arranged in a free loop to allow engine swing.

Fig. 1. Control Box Measurements



1.3 CONNECTING THE CABLES

1.3.1 CABLE OPERATING MODE

Ascertain the correct kind of action required by the specific engine.
The following Table 1 provides a list of engines with the required cable action for shift and throttle control.

ENGINE	SHIFT CABLE ACTION	THROTTLE CABLE ACTION
JOHNSON/EVINRUDE OMC IN.OUTBOARD MERCURY 18, 25 H.P.	"PULL" TO GO FORWARD	"PUSH" TO OPEN THROTTLE
MERCURY OUTBOARDS MARINER OUTBOARDS MERCRUISER IN/OUTBOARDS	"PULL" TO GO FORWARD	"PUSH" TO OPEN THROTTLE
VOLVO IN/OUTBOARDS	"PUSH" TO GO FORWARD	"PULL" TO OPEN THROTTLE
YAMAHA 90 H.P. & UP U.S MARINE (FORCE)	"PULL" TO GO FORWARD	"PUSH" TO OPEN THROTTLE
YAMAHA IN/OUTBOARD	"PULL" TO GO FORWARD	"PUSH" TO OPEN THROTTLE
HONDA, SUZUKI, TOHATSU YAMAHA 70 H.P. & BELOW	"PULL" TO GO FORWARD	"PUSH" TO OPEN THROTTLE
INBOARDS (DIESEL, GAS)	MOST TRANSMISSIONS "PULL" TO GO FORWARD	MOST TRANSMISSIONS "PULL" TO GO FORWARD

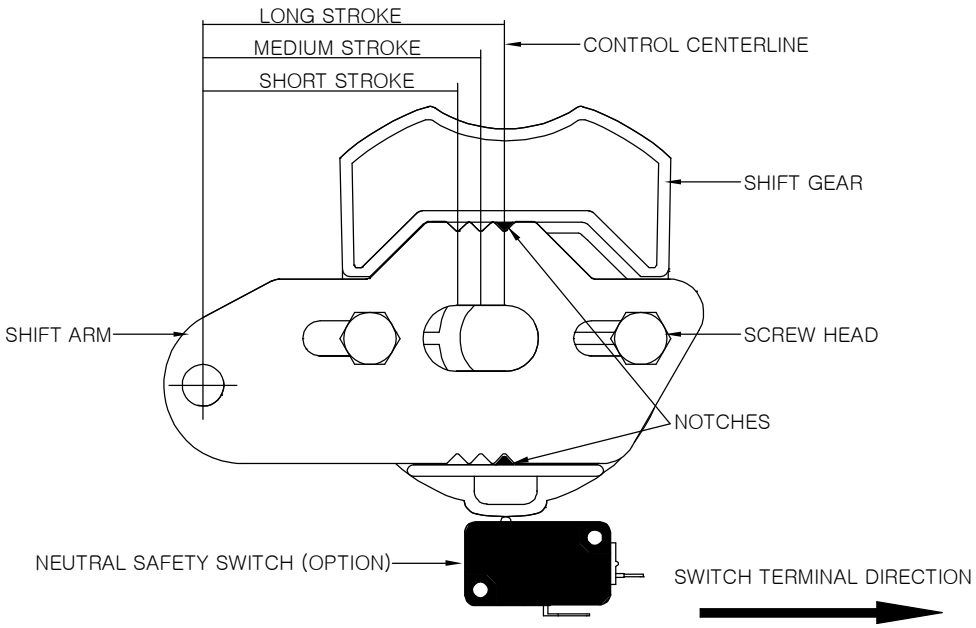
TABLE 1-Cable Action with Reference to Engine Installation.

1.3.2 ADJUSTING THE SHIFT CABLE STROKE

The control box can be easily adapted for short (2.70 in / 68.5mm), medium(2.96 in / 75.12mm) or long (3.22 in / 81.72mm) travel of the shift cable. Refer to Fig. 2 where the long travel setting is shown. The standard setting at manufacturing is the medium one(center notch). Setting change is obtained as follows

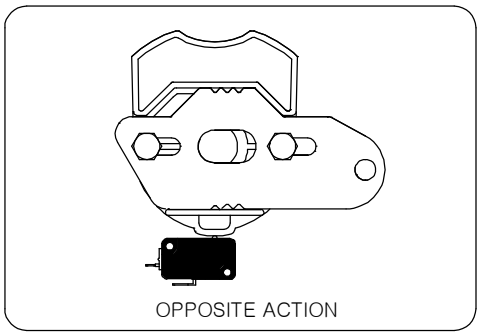
- Loosen the two screws fastening the shift arm.
- Release then reset the shift arm to the required travel notch.
- Retighten the two fastening screws.

Fig. 2. Shift Cable Stroke Setting



TOTAL SHIFT CABLE STROKE (AT THE CONTROL)

SHORTEST = 2.70 Inches (68.5mm)
MEDIUM = 2.96 Inches (75.12mm)
LONGEST = 3.22 Inches (81.72mm)



1.3.2 CONNECTING THE SHIFT CABLE

- Check the shift arm setting for cable travel (short, medium or long). Reset if necessary following the above procedure (Refer to Fig.2)
- Check the shift arm setting for cable action (pull or push). Refer to Table 1 for proper action referred to the installed engine.

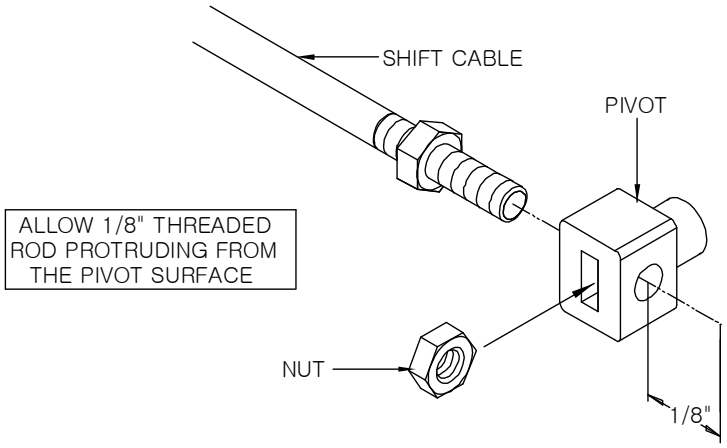
  1. Reversing of the shift arm position on the set gear.
  2. Reversing of the neutral safety switch mounting.

- After inserting the jam nut (Refer to Fig. 3), screw the swivel joint on the shift cable rod end. Allow 1/8inch (3.18mm) threaded rod protruding from the joint surface.

- Run the cable end to the rear side of the shift arm then drive the swivel joint through the connecting hole. Insert the cotter pin keeping the swivel joint into position.

- Fasten the cable to casing to the lower part of the housing at the provided hole location for E2, E3, C33, C2, C8, 33C type cables. Make sure the fastening clamp positively engages the groove in the cable casing end.

Fig. 3. Shift Cable Swivel Connection



1.3.3 CONNECTING THE THROTTLE CABLE

Control Box End

- Check the required throttle cable action (pull or push to open) with reference to the installed engine. Refer to Table 1.
- Remove the hand lever and the control box side cover.
- Check and note the setting of the throttle arm, the link assembly arrangement and the swivel bracket position. (Refer to Figures 4 and 5).
  If cable action changing is required from **pull to push** or vice versa proceed as follows:

1. Remove the swivel bracket from the link assembly.
2. Remove the two fastening screws and then remove the link assemble from the shift gear. Avoid disturbing the shift arm setting on the selected travel notch.
3. Push in and rotate the throttle arm 180 degrees until it snaps back and locks into position (cable pivot downward for pulling, upward for pushing).
4. Rearrange and screw the link assembly (link turned upward for pulling, downward for pushing)
5. Reposition and install the swivel bracket in the proper hole on the link assembly (upper hole for pulling. lower hole for pushing) Ascertain the swivel bracket **rotates freely**.

- Install and secure the cable terminal or the throttle arm pivot by means of the suitable washer and retaining ring.
- Fasten the cable casing to the swivel bracket. Ascertain the fastening clamp positively engages the groove in the cable casing end.
- Reinstall the box housing and the hand lever.

Fig. 4. "Pull to Open" Setting

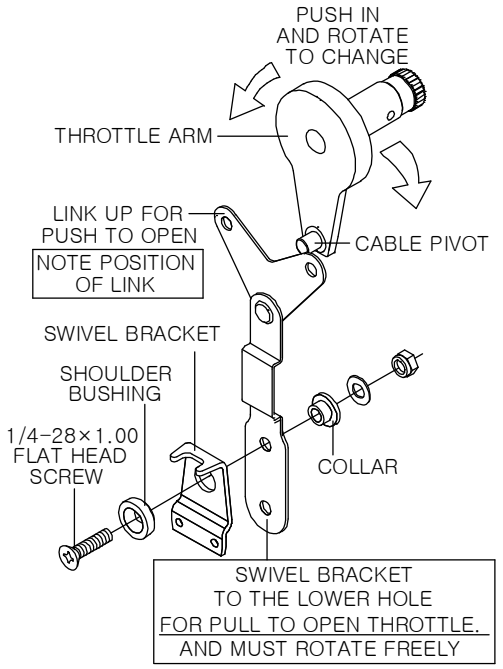
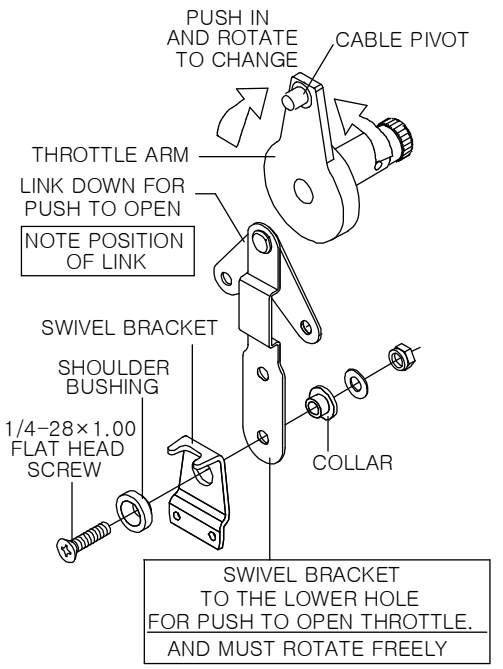


Fig. 5. "Push to Open" Setting



Engine End

CAUTION : Disconnect the throttle cable from the engine before rigging the engine idle. Failure of the above precaution may result in damages to the control, to the cable and to the engine.

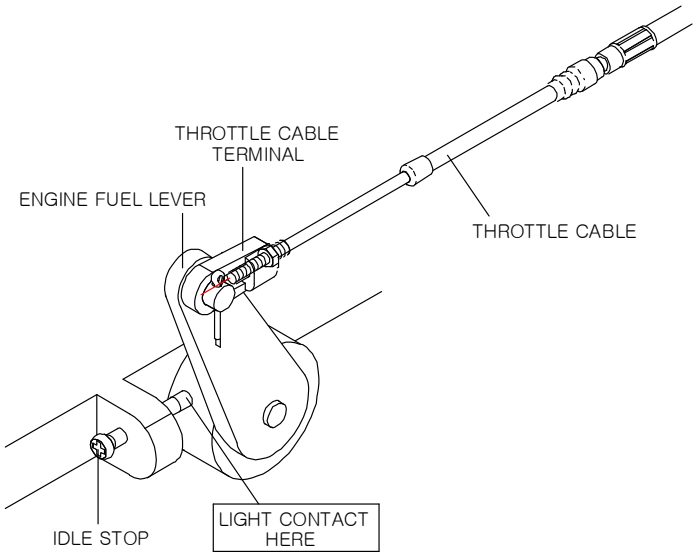
- Ascertain the control is in neutral detent.

- Check the engine throttle lever is in a light contact against the idle stop screw (Refer to Fig. 6)

- Connect the throttle cable to the engine throttle lever.

- Pull out the hand lever hub then advance the lever from the neutral detent over the forward range. Return the hand lever to neutral : the lever should snap back when at neutral.

Fig. 6. Engine Throttle Connection



1.4 CONNECTING THE NEUTRAL SAFETY SWITCH (OPTION)

The neutral safety switch prevents the engine starting when the transmission is engaged (Refer to Fig. 7)

- Set the control lever to the neutral detent.

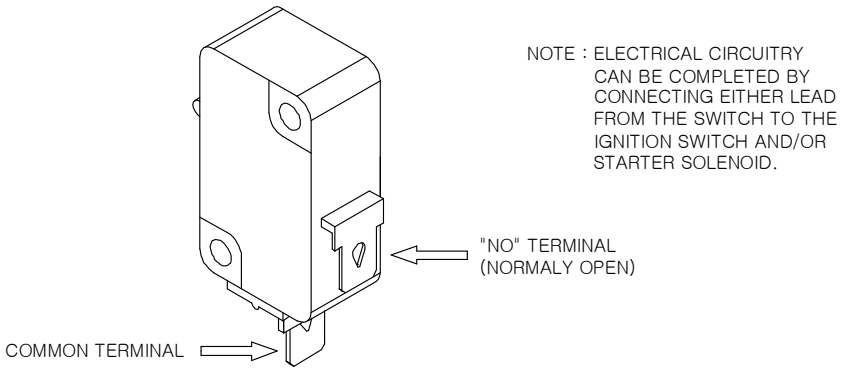
- Check the neutral safety switch for continuity.
  A test set made of a lamp series-connected with a battery can be used:

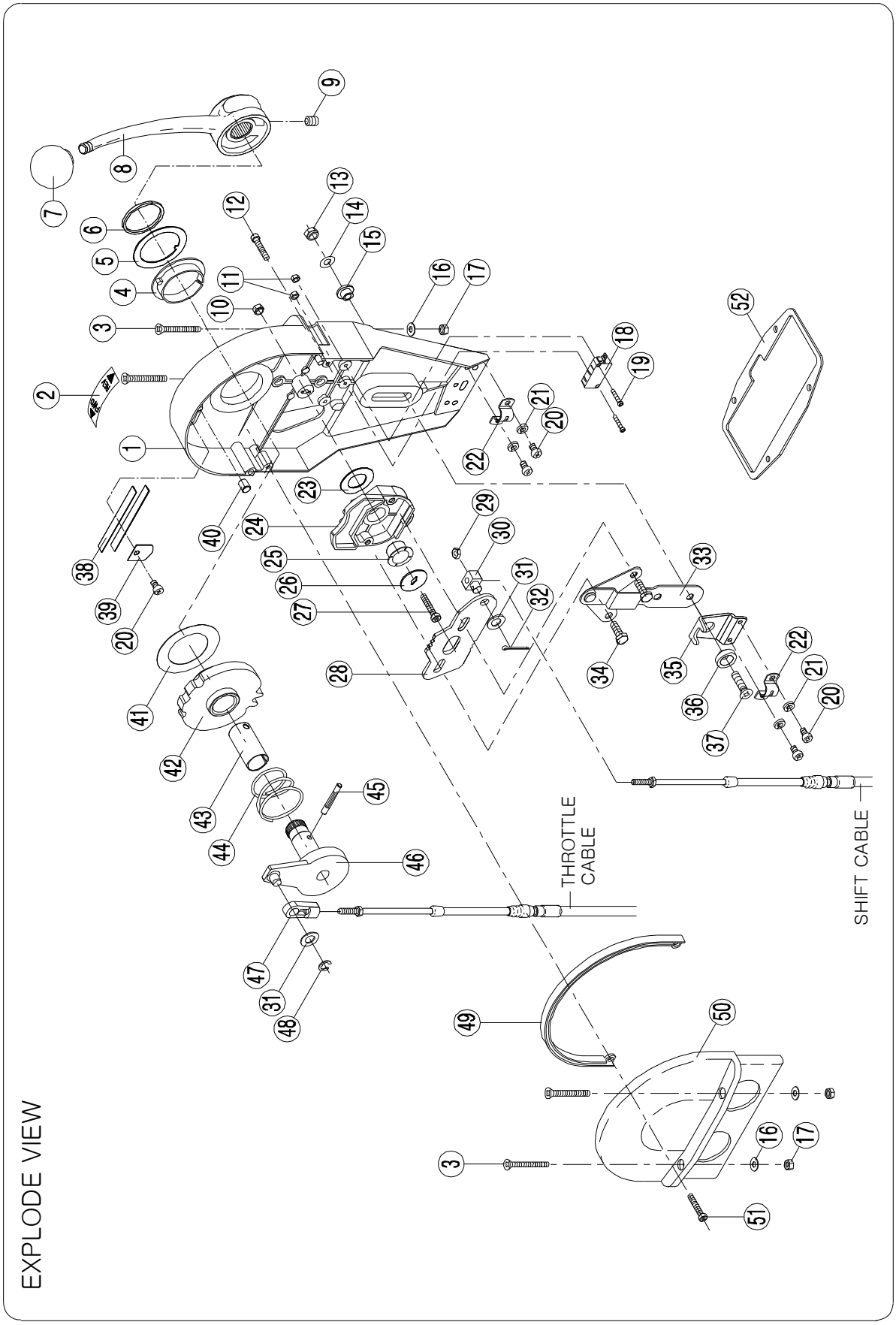
  1. Connect one end of the tester to the COMMON terminal and the other one to the NO (Normally Open) terminal of the switch: the test lamp must light on.
  2. Move the hand lever away from the neutral detent in both directions:
     the test lamp must extinguish.

CAUTION : Electrical continuity must be assured only when the control is set in neutral. Absolutely no electrical continuity is to be allowed when the control is in gear.

- Connect one terminal of the neutral safety switch to the ignition switch (start lead) and the other one to the starter solenoid.
  Terminals and insulators provided with the control are to be used in order to avoid short-circuit possibility.

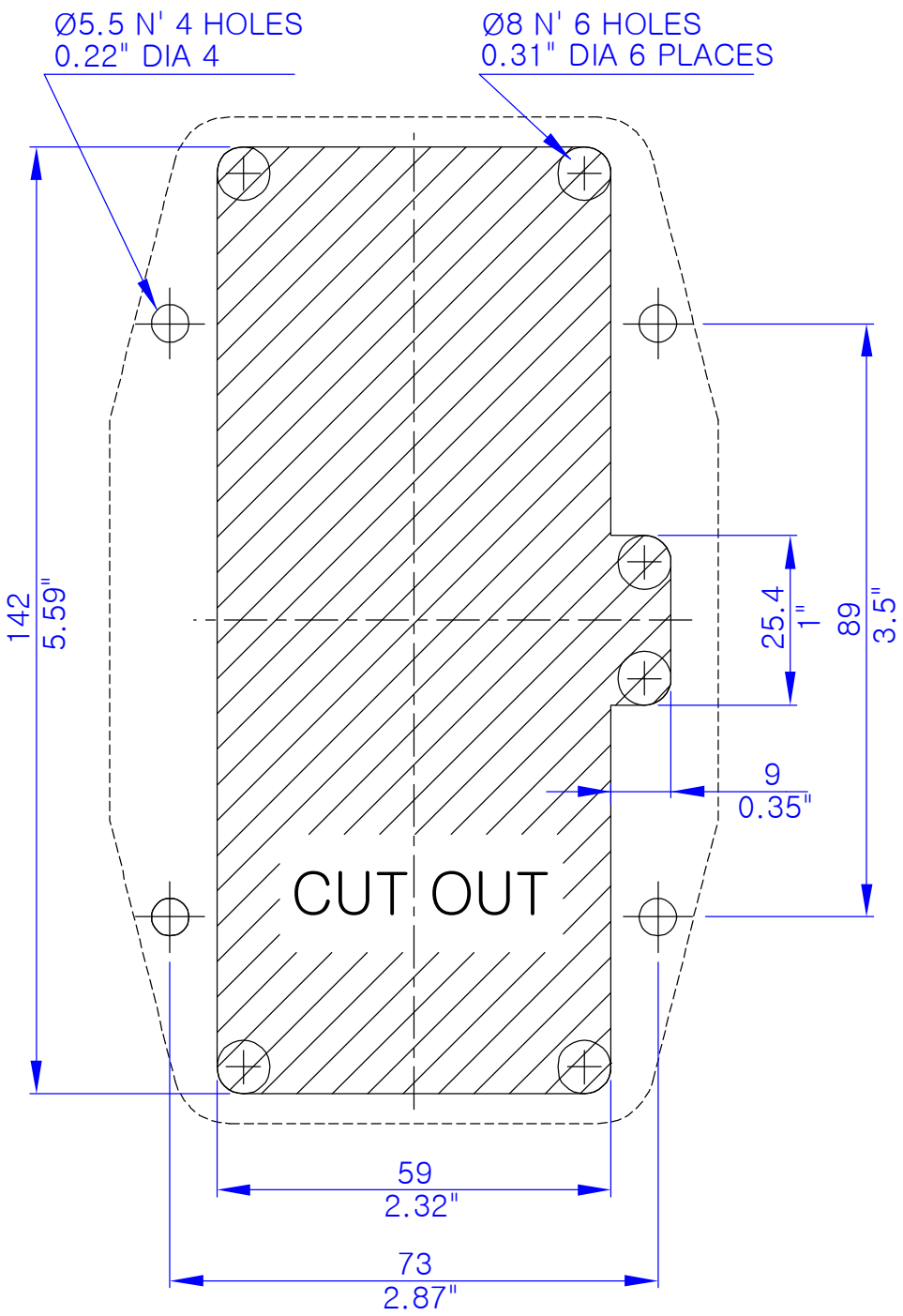
Fig. 7. Neutral Safety Switch (Option)



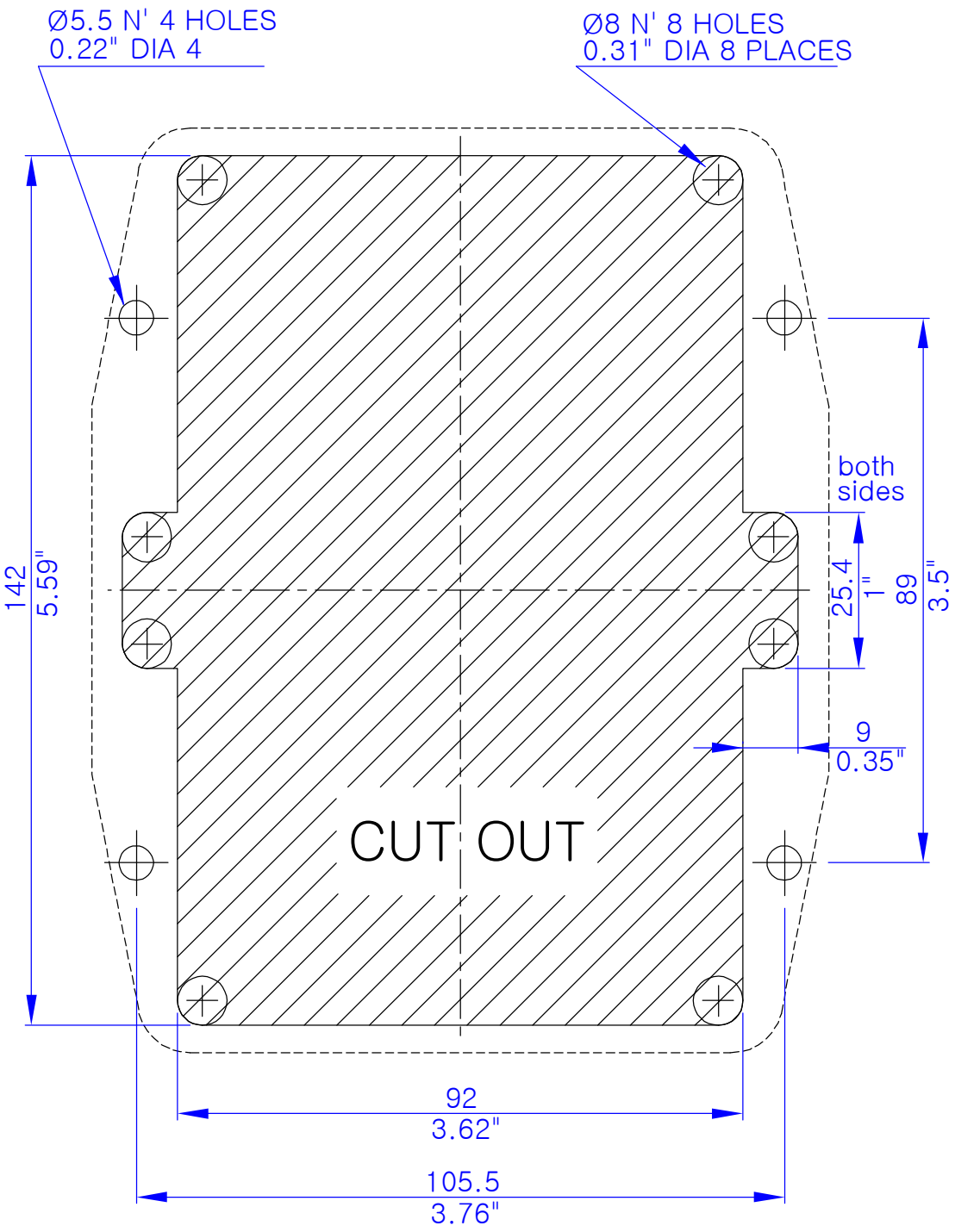

EXPLODE VIEW
THROTTLE CABLE
SHIFT CABLE

BILL OF MATERIAL

ITEM	QUANTITY	DESCRIPTION	PART NUMBER
1	1	HOUSING, CHROME	9551
2	1	DECAL-'FWD-REV'	9606
3	4	OVAL HEAD SCREW, #10-24 x 1.50 LONG	COMMERCIAL 9583
4	1	DRIVE GEAR BEARING	9568
5	1	KEYED WASHER	9562
6	1	SPLIT RING	9576
7	1	BLACK BALL KNOB (OPTION : CHEST NUT)	9602
8	1	HANDLE	9553
9	1	HEX SOCKET SETSCREW, 5/16-18 x 1/2 LONG	COMMERCIAL 9584
10	1	HEX ELASTIC STOP NUT, #10-32	COMMERCIAL 9585
11	2	HEX NUT, #4-40	COMMERCIAL 9586
12	1	FILLISTER HAED PHILLIPS SCREW #10-24 x 1.00 LONG	COMMERCIAL 9591
13	1	HEX ELASTIC STOP NUT, 1/4-28	COMMERCIAL 9588
14	1	M6 FLAT WASHER	9589
15	1	COLLAR	9569
16	4	M5 FLAT WASHER	9600
17	4	HEX NUT, #10-24	COMMERCIAL 9590
18	1	NEUTRAL SAFETY SWITCH (OPTION)	9603
19	2	ROUND HEAD SCREW, #4-40 x .62 LONG	COMMERCIAL 9592
20	4	FILLISTER HAED SCREW #10-24 x .31 LONG	COMMERCIAL 9599
21	4	SPRING WASHER (M5)	9601
22	2	CABLE CLAMP	9565
23	1	SPACER WASHER	9573
24	1	SHIFT GEAR	9555
25	1	SHIFT BEARING	9570
26	1	THRUST WASHER	9564
27	1	ROUND HEAD SCREW, #10-32 x 1.00 LONG	COMMERCIAL 9593
28	1	SHIFT ARM	9558
29	1	HEX JAM NUT, #10-32	9582
30	1	CABLE PIVOT	9566
31	1	FLAT WASHER (M8)	9597
32	1	COTTER PIN, .093 x .50 LONG, BRASS	COMMERCIAL 9598
33	1	LINKAGE ASSEMBLY	9557
34	2	HEX HEAD SCREW, 1/4-28 x .62 LONG	9595
35	1	SWIVEL BRACKET	9572
36	1	SHOULDER BUSHING	9569
37	1	FLAT HEAD SLOTTED SCREW, 1/4-28 x 1.00 LONG	COMMERCIAL 9594
38	4	FLAT SPRING (THIN 3 + THICK 1)	9561
39	1	DETENT RETAINER CLIP	9663
40	1	DETENT ROLLER	9578
41	1	WAVED WASHER	9560
42	1	DRIVE GEAR	9554
43	1	THROTTLE ARM BEARING	9571
44	1	CONICAL SPRING	9577
45	1	GROOVE-PIN, TYPE 5, .187 DIA. x 1.38 LONG, SST	9579
46	1	THROTTLE ARM ASSEMBLY	9556
47	1	CABLE TERMINAL	9567
48	1	E-RING, .312 NOMINAL	9596
49	1	MIDDLE (PVC) RING	9574
50	1	SIDE COVER	9552
51	1	FILLISTER HEAD PHILLIPS SCREW, # 10-24 x .62 LONG	COMMERCIAL 9587
52	1	RUBBER BOARD	9612



3200.1 SINGLE CONTROL TEMPLATE



3200.2 TWIN CONTROL TEMPLATE

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