



Pro-Matic 2 Shifter

1983 and Later General Motors TH200 4R/TH700 R4
4-Speed Overdrive Automatic Transmissions

Catalog #383 8504

Installation Instructions

Congratulations on your purchase of the Hurst...Pro-Matic 2, the finest ratchet action shifter available today. Show it off proudly...when properly installed, this shifter will assure you many years of high performance satisfaction by providing precise and positive gear change control for street or competition automatic transmissions. It is another high quality shifter built by Hurst Performance, "America's Number One Shifter".

Features of the Hurst Pro-Matic 2 Shifter

- * Full ratchet action for quick, positive gear shifts.
- * Positive "Reverse" lock-out, as required by NHRA rules.
- * Heavy-duty shifter cable, renowned for its superb quality and used by the most respected racers.
- * Engineered for years of precise, trouble-free shifting.
- * Easy to install and complete with all necessary mounting hardware.

Before you begin installation of the Pro-Matic 2 shifter, please take a few minutes to read the installation instructions thoroughly.

Important!

Read all of this information carefully.

1. All adjustments must be made with shifter and transmission in "Park", "Neutral", and "Low" gear positions.
2. Adjustments are critical and must be precise.
3. Do not mix components (all parts including shifter cable must be genuine Hurst components provided with kit).
4. If a shifter is removed and reinstalled, adjustments must be checked and re-adjusted.
5. Routing of cable should avoid sharp bends. Provide large full loops (if needed) for smooth shifting and long cable life. Avoid routing cable near exhaust pipes as heat from the exhaust system will melt cable casing. (Permanent damage of cable will result.)
6. Always check cable for freedom of movement before connecting at shifter and transmission control arm.

Failure to comply with any of the above may result in malfunction of shifter operation. Damage to cable due to sharp bending, kinking, or melting is not covered by warranty.

WORK SAFELY

Perform this installation on a good clean level surface for maximum safety and with the engine turned "Off".

Note: Installation of this shifter requires working underneath vehicle. Raise front of vehicle by lifting at points specified by the vehicle manufacturer. Place blocks or wedges in front of and behind both rear wheels to prevent movement in either direction. Support the vehicle with approved automotive support stands or wheel ramps. DO NOT USE A BUMPER JACK FOR SUPPORTING VEHICLE.

Caution: To avoid any possibility of bodily injury, do not get underneath vehicle until you are confident that it is safely supported and will not move or fall from its raised position.

For identification of shifter components, refer to the item # (circled number in illustration) listed under IDENTIFICATION AND CONTENTS OF SHIFTER KIT.

INSTALLATION OF PRO-MATIC 2 SHIFTER

1. Disconnect negative (-) battery cable.

Caution: When removing or connecting the battery cable terminal, use care to avoid intermittent contact (arcing or sparking) between battery post and terminal end. This generates voltage spikes that can damage sensitive ECM (Electronic Control Module) components or memory circuits.

2. Place factory shifter in "Park" position. Column shift applications: remove drive pin that fastens shifter lever to column, then remove lever from steering column. Disconnect and remove all linkage rods from steering column and transmission control arm.

Factory console mount shifters: remove shifter assembly, console, cables, cable brackets, or rods that are attached to shifter and transmission control arm.

Use metal plate supplied to cover the hole in floor tunnel that was left from factory floor shifter. Attach metal plate to floor tunnel by using sheet metal screws (not supplied) or riveting in place.

Place Pro-Matic 2 Shifter stick in "Neutral" position and remove knob (Item #1). Lift console (Item #7) up and off. Remove one (1) #8 x 3/4" self-tapping screw (Item #2) that fastens chrome console cover (Item #5) to console and separate.

4. Position shifter in a desired location on centerline of floor tunnel, allow clearance for seat travel and shifter stick travel when shifting into "Park" position. Cut a small section of carpet where shifter assembly will mount to floor tunnel (make sure there are no wires underneath carpet). Place shifter assembly (Item #8) in selected location, mark and center punch four (4) mounting holes. Drill through floor tunnel using a 9/32" drill bit. (Refer to Figure 1).

Important: When shifter is engaged in "Low" gear position, the ratchet plate will move below the shifter frame. Using a ballpeen hammer, dimple (concave) this area of the floor tunnel to provide the clearance necessary for the ratchet plate to move freely into "Low" gear position.

5. If necessary, mark and cut a slit in carpet to accommodate the shifter cable. Using a hole saw or other suitable tool, make a 1-1/2" diameter hole in floor tunnel 3" in front of forward mounting hole and 1-3/4" to the left of forward mounting hole to accommodate cable. For some vehicles the 3" dimension may be less. Deburr hole with a file and sand with emery cloth. Install rubber grommet (Item #12) into 1-1/2" cable hole. (Refer to Figure 1).
6. Attach shifter assembly to floor tunnel using four (4) 1/4-20 x 1" hex head bolts (Item #9), 1/4" flatwashers (Item #14), and 1/4-20 hex nuts (Item #15). Tighten securely. Install two (2) 1/4"-20 x 3/4" u-type clip fasteners (Item #10) onto front and rear of shifter assembly. When installing these clips be sure extruded side is underneath mounting hole facing downward. (Refer to Identification and Contents of Shifter Kit.)
7. Remove backdrive linkage rod and transmission control arm from gear selector shaft on transmission using a 15mm socket and replace with Hurst transmission control arm (Item #20 for TH700 R4 Part No. 105 8567) or (Item #21 for TH200 4R Part No. 105 8572). These transmission arms must be installed with round hole pointing down and bend in arm positioned away from transmission. (Refer to Figure 3).

Note: The component identification number is stamped into each transmission control arm for reference.

Important! Vehicles Equipped with Steering Column Lock

In some applications the backdrive linkage system that locks the steering column and shifter in "Park" position may be retained depending on factory transmission control arm configuration.

One side of the transmission arm must have a flat unobstructed surface in order to be reused and retain the factory backdrive linkage system.

Carefully position Hurst transmission arm on top of or behind the factory transmission arm as illustrated. (Refer to Figure 2). The alignment of the mounting slots in both transmission arms is very important. With slots aligned, clamp arms together and weld along indicated lines. Allow transmission arm to cool, and replace on to transmission gear selector shaft using the stock 15mm nut. Reinstall backdrive linkage.

Note: If the backdrive linkage system is not going to be retained, the gear shift lever (located inside engine compartment on steering column) must be secured in the upward position. This will allow ignition key to be turned to "Lock" position and withdraw freely out of lock.

8. Remove two (2) factory transmission oil pan bolts (using 13mm socket) from left (driver) side of transmission as indicated. Attach Hurst cable bracket (Item #19) to transmission oil pan reusing stock 13mm bolts. Do not overtighten (Refer to Figure 3).

Note: Hurst shifter cable bracket features slotted mounting holes to allow for adjustment of cable forward or rearward.

9. Cable Installation

CAUTION

When installing shifter cable, avoid sharp bends or kinks. Damage to cable due to sharp bending or kinking is not covered by warranty.

Remove 3/16" hex nut, two (2) rubber boots, two (2) 7/16" hex nuts, and two (2) internal tooth lockwashers from threaded end of shifter cable and set aside. Using tape, wrap the sections of cable that rubber boots were covering so that dirt or grease will not get imbedded inside cable housing causing the cable to scuff and bind. Insert cable from inside vehicle through rubber grommet in floor tunnel. Route cable so there are no sharp bends that would make the shifter hard to operate. Make sure cable clears all exhaust pipes by at least 1-1/2".

Cable end with mounting tab attached (shifter assembly end) must slip into slotted opening on shifter frame, position tab on the inside of shifter frame. Fasten using 1/4"-20 x 3/4" bolt (Item #13) and hex nut (Item #15). Attach cable end onto pin in shifter assembly and secure using 3/16" flatwasher (Item #22) and cotter pin (Item #17). (Refer to Identification and Contents of Shifter Kit).

Remove tape from cable and reinstall rubber boots. Place shifter cable into mounting bracket on transmission oil pan and fasten using two (2) internal tooth lockwashers and two (2) 7/16" hex nuts supplied on cable.

10. Make sure shifter stick is in "Neutral" position. Then check to be sure that control arm on transmission gear selector shaft is also in "Neutral" position.

Thread cable pivot (Item #18) onto end of shifter cable. Adjust cable pivot until it aligns with hole in transmission arm. When properly adjusted lock cable pivot in place using 3/16" hex nut. Insert cable pivot into transmission arm so pivot end is facing outward away from transmission. Temporarily install cotter pin (Item #17).

11. Cable Adjustment

If cable pivot cannot be inserted into transmission arm, reposition cable pivot, shifter cable hex nuts, or adjust position of transmission cable bracket forward or rearward. Once shifter cable is adjusted properly, snug all adjustment nuts and bolts. (Refer to Figure 3).

Important: Use tie straps or clamps to secure shifter cable away from the exhaust pipes and engine.

12. NEUTRAL/PARK START SWITCH WIRING CONNECTION

Important: The Pro-Matic 2 shifter uses an electrical neutral/park start switch that replaces the original factory neutral safety switch on most applications.

The original factory neutral safety switch is typically located at the lower end of steering column. For your particular application refer to the vehicle manufacturer's service manual for the correct location.

Pre-wire Hurst neutral/park start switch (front switch located on shifter assembly) using two (2) female crimp connectors (Item #23) and two (2) suitable lengths of 16 gauge insulated automotive grade wire (not supplied). Strip 1/4" of insulation off each end of wire and firmly crimp female connector onto one end of each wire. Push female connectors onto switch terminals. Route wiring away from shifter assembly so it will not interfere with internal moving parts. (Refer to Figure 5).

Locate wire connected to starter solenoid terminal marked "S" and trace to original neutral switch. Locate wire connected to "Solenoid" terminal of ignition switch and also trace to original neutral switch. Disconnect both wires leading to switch and connect to Hurst neutral/park start switch wire leads. Use correct size insulated electrical butt connectors to properly connect the wires together. (Refer to Figure 5.)

Note: If Pro-Matic 2 shifter is used in an application without an original neutral/park start switch, locate wire connecting "S" terminal on starter solenoid to "Solenoid" terminal of ignition switch. Cut this wire and splice in the Hurst neutral park/start switch.

Warning: Failure to wire and connect switch correctly can allow engine to start in "Drive" or "Reverse" causing unexpected vehicle motion and possible bodily injury or property damage.

13. BACK-UP LIGHT SWITCH WIRING CONNECTION

Pre-wire Hurst back-up light switch (rear switch located on shifter assembly) using two (2) female crimp connectors (Item #23) and two (2) suitable lengths of 16 gauge insulated automotive grade wire (not supplied). Strip 1/4" of insulation off each end of wire and firmly crimp female connector onto one end of each wire. Push female connectors onto switch terminals. Route wiring away from shifter assembly so it will not interfere with internal moving parts.

Locate wire lead connected to back-up lights and trace to the original factory back-up light switch. Disconnect both wires leading to the back-up light switch and connect to Hurst back-up light switch wire leads. Use correct size insulated electrical butt connectors to properly connect the wires together. Note: One wire lead from the Hurst back up light switch must have 12 volt power when the ignition key is in the "On" position. (Refer to Figure 5).

Note: For your particular application refer to the vehicle manufacturer's service manual for the correct location of back-up light switch.

14. Shift Indicator Lamp Socket Wiring Connection

Use a suitable length of 22 gauge insulated automotive grade wire (not supplied). Strip 1/4" of insulation off each end of wire. Connect lead wire from lamp assembly (Item #16) to this wire using the correct size electrical butt connector. Connect other end of wire to electrical circuit of instrument panel lights.

Important: The shifter assembly must have a good chassis "ground" for indicator lamp to work properly.

15. Shifter Operation

Caution: Before testing shifter operation, it is recommended that vehicle be placed back on the ground, parking brake applied and wheels blocked. Vehicle should be parked in a safe location for testing. Be sure that no one is in front of or behind vehicle during testing.

Engine must be turned "Off" (not running) to prevent damage to transmission. Apply brake pedal pressure while testing. Familiarize yourself with the operation of this shifter by moving the shifter stick backward and forward through entire shift pattern (Refer to Figure 6). Move stick through each gear selection, counting positions as you feel them P - R - N - (D) - D - 2 - 1. (Also Refer to Gear Shift Pattern Changes).

Cable pivot attached to transmission control arm should be checked in "Park", and "Low" gear positions to make sure cable pivot slides freely "IN" and "OUT" of transmission control arm. Move shifter stick into "Low" gear and check adjustment underneath vehicle by removing cotter pin and cable pivot from transmission arm. Check to be sure that transmission is Fully Engaged in "Low" gear. When cable adjustment is correct, shifter will engage "Park" and "Low" gears properly. Once adjustment is completed, secure cotter pins on either end of shifter cable and be sure all adjustment bolts/nuts are tightened securely.

WARNING: Correct cable adjustment is mandatory to insure that when shifter is in "Park" position, transmission is also fully into the "Park" detent. Failure to adjust cable correctly could result in unexpected vehicle motion when shifter is in "Park" or "Neutral" positions.

16. SHIFTER, STARTER MOTOR, AND BACK-UP LIGHT TEST OPERATION

We recommend disconnecting the "batt" wire from distributor so engine will crank but not start. Reconnect negative (-) battery cable. With the shifter in "Park" position and brake pedal pressure applied. Test starter motor operation in every gear position of the shift pattern. The starter must operate in "Park" and "Neutral" gear positions ONLY. If starter operates in any other gear position, re-check wiring to be sure connections and adjustment of switches are correct. Also test operation of back-up lights - lights should operate in "Reverse" only. Turn "On" instrument panel lights and check operation of gear indicator lamp.

Note: The Hurst neutral/park start switch and back-up light switch are preadjusted from the factory for your convenience. If adjustment is needed, loosen the screw located at the top of switch mounting bracket and pivot switch assembly inward until the required contact is made between switch and actuator plate. Shifter must be in the correct gear selection (Park, Neutral, or Reverse) when making this adjustment.

CONSOLE INSTALLATION

17. Note: In some applications shifter console must be trimmed to fit the contour of floor tunnel.

Place console (Item #7) over shifter assembly and hold it level with shifter. The inside of console top must rest on the two (2) mounting ears of shifter assembly (Refer to Figure 7).

Measure distance "A" from underside of console to the console mounting ears on shifter assembly. Using a pair of dividers, set to the dimension of distance "A", touch one end of dividers to console and other end to floor tunnel. Scribe a line on the console to match the contour of floor tunnel by keeping dividers perpendicular to floor tunnel, drag dividers along floor tunnel and against console.

Using a utility knife, carefully score a firm cut over the line scribed into console. To prevent any unnecessary cracking, it is recommended that console be at room temperature before cutting or trimming portion below scribed line. Remove any burrs or rough edges with a small file.

Place console cover (Item #5) onto console (Item #7), and fasten using two (2) #8 x 3/4" self-tapping screws (Item #2).

Place console onto shifter assembly and fasten using two (2) #8 x 1-3/4" self-tapping screws (Item #3). Slide rubber boot (Item #4) over shifter stick and work it into the chrome console cover. Thread shifter knob onto stick, turn to desired position and tighten jam nut against knob.

18. Once all adjustments have been made and shifter functions properly, check operation of steering column lock. It must operate in "Park" position ONLY. It is very important that the column lock be adjusted correctly so that when shifter is placed into "Park" position, ignition key can be turned to "Lock" position. Steering wheel should lock and key should withdraw freely out of lock. The shifter then must not be able to be moved to any other gear position. If the shifter can be moved to other gear positions, column lock is not adjusted correctly and must be re-adjusted.

GEAR SHIFT PATTERN CHANGES

UPPER GATE MODE - GEAR SELECTION

The upper gear selection gate of the shifter operates "Park" and "Reverse". When in "Park" position the shifter stick must be lifted to clear the safety stop between "Park" and "Reverse", then pulled straight back to engage "Reverse". Once in "Reverse" the handle will drop down slightly and shifter is ready to be pulled straight back to "Neutral". When "Neutral" is engaged the stick will drop again and enter the lower gate (ratchet mode) of shifter. (Refer to Figure 6).

LOWER GATE MODE - GEAR SELECTION

The lower gear selection gate of the shifter operates "Neutral", "Overdrive", "Drive 3", "Drive 2", and "Drive 1" low gear. The shifter stick ratchets back and forth from "Neutral" to "Drive 1" (low gear).

DOWN SHIFTING

- | | |
|--------------------------------|---|
| Park to Reverse | - Lift stick, pull back to next detent for "Reverse".
Stick will drop down slightly. |
| Reverse to Neutral | - Pull back to next detent for "Neutral".
Stick will drop down again. |
| Neutral to Drive 4 "Overdrive" | - Push down then pull back to next detent and release for Drive 4 "Overdrive". |
| Drive 4 "Overdrive" to Drive 3 | - Pull back to next detent and release for "Drive 3". |
| Drive 3 to Drive 2 | - Pull back to next detent and release for "Drive 2". |
| Drive 2 to Drive 1 | - Pull back to stop position and release for "Drive 1". |

GEAR SHIFT PATTERN CHANGES (CONTINUED)

UP SHIFTING

- Drive 1 to Drive 2 - Push stick forward to next detent and release for "Drive 2".
- Drive 2 to Drive 3 - Push stick forward to next detent and release for "Drive 3".
- Drive 3 to Drive 4 "Overdrive" - Push stick forward to next detent and release for Drive 4 "Overdrive".
- Drive 4 "Overdrive" to Neutral - Push stick forward to next detent and release for "Neutral".
- Neutral to Reverse - Lift stick upward, push forward to next detent for "Reverse".
- Reverse to Park - Lift stick upward, push forward to stop position for "Park".

Note: Retain this Instruction Sheet for Future Reference.

Technical Service

A highly trained Technical Service Department is maintained by Hurst Performance to answer your technical questions, provide additional product information and offer various recommendations. See your local retailer of Hurst products for specific prices.

For best results, Technical Service calls, correspondence and warranty questions should be directed to the following address:

Hurst Performance
8700 Brookpark Road
Cleveland, Ohio 44129-6899

Phone: (216) 398-8300
8:30 A.M. - 5:00 P.M. EST

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DM:jes
4/25/91

IDENTIFICATION AND CONTENTS OF SHIFTER KIT

1. Shifter Knob	Pt. 163 0064
2. Self-Tapping Screw #8 x 3/4"	Pt. 97093105 (2)
3. Self-Tapping Screw #8 x 1-3/4"	Pt. 97093106 (2)
4. Rubber Boot	Pt. 114 8550
5. Console Cover	Pt. 195 8551
6. Indicator Lens	Pt. 169 0005
7. Console	Pt. 129 8554
8. Shifter Assembly	Pt. 383 0508
9. Hex bolt 1/4"-20 x 1"	Pt. 97080969 (4)
10. 1/4"-20 x 3/4" U-Type Clip Fastener	Pt. 97093081 (2)
11. Shifter Cable	Pt. 500 8555
12. Rubber Grommet (Floor Tunnel)	Pt. 97093109
13. Hex Bolt 1/4"-20 x 3/4"	Pt. 97090029
14. Flat Washer 1/4"	Pt. 97000818 (4)
15. Nut 1/4"-20	Pt. 97000910 (5)
16. Lamp Assembly	Pt. 97093103
17. Cotter Pin 1/16"	Pt. 97093086 (2)
18. Cable Pivot	Pt. 97X93089
19. Transmission Cable Bracket	Pt. 117 4778
20. Transmission Control Arm TH700 R4	Pt. 105 8567
21. Transmission Control Arm TH200 4R	Pt. 105 8572
22. Flat Washer 3/16"	Pt. 97000905
23. Female Wire Connector	Pt. 252 7600 (4)

Note: Female wire connector (Item #23) not shown.
Refer to Figure 5.

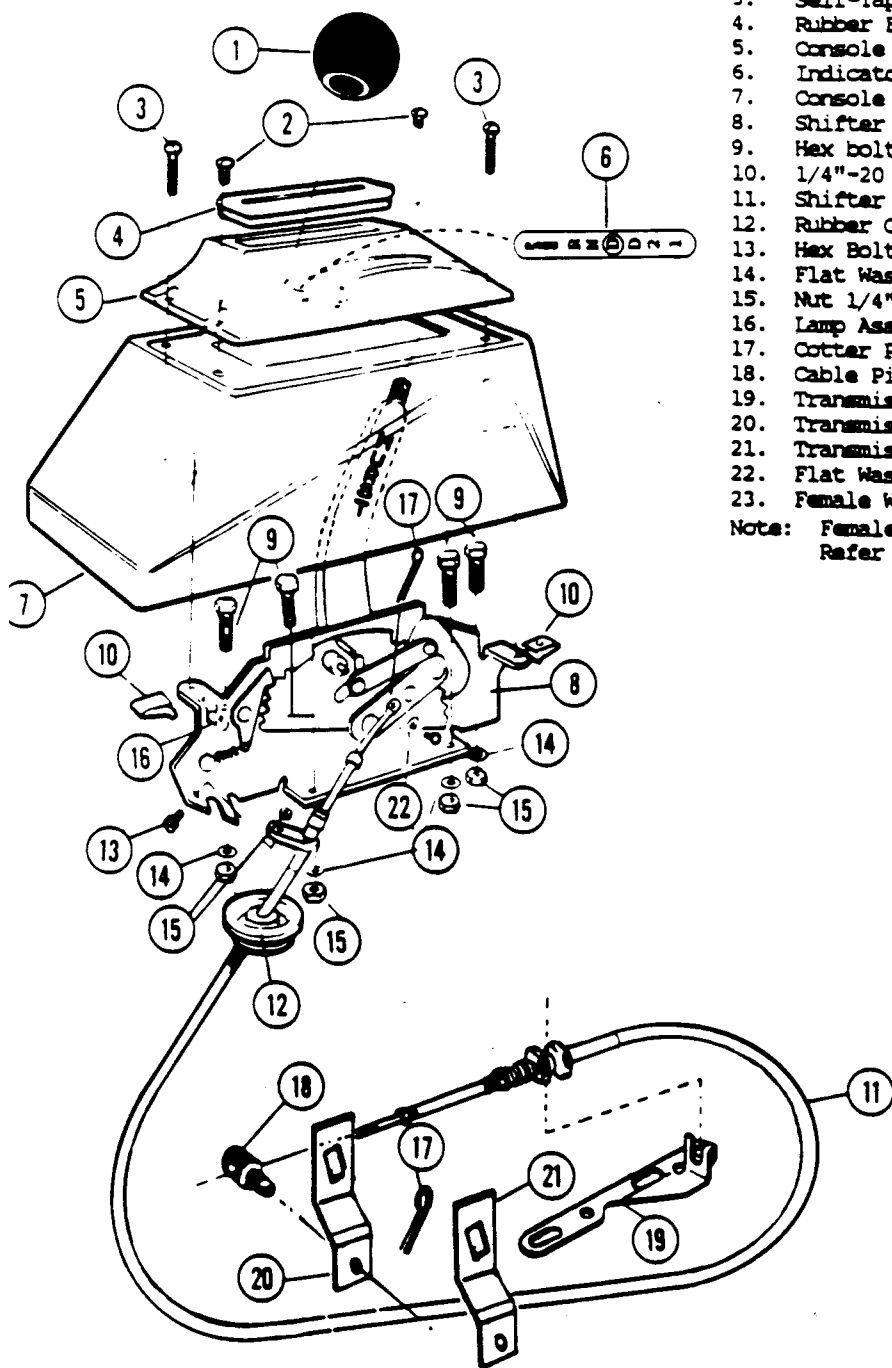


Figure 1.

TOP VIEW OF SHIFTER MOUNTING
AND CABLE MOUNTING HOLE PATTERNS

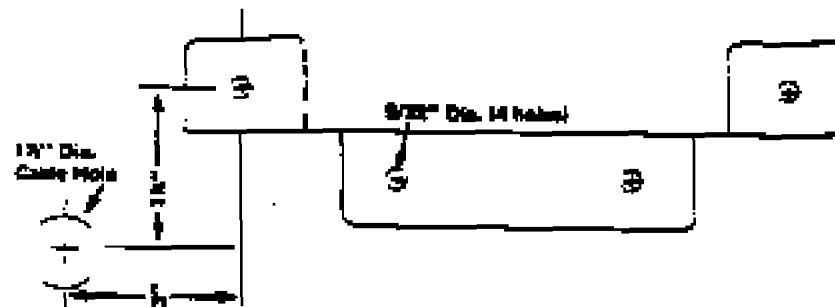


Figure 2.

POSITION OF FACTORY TRANS ARM ON TO
HURST TRANS ARM FOR WELDING OPERATION

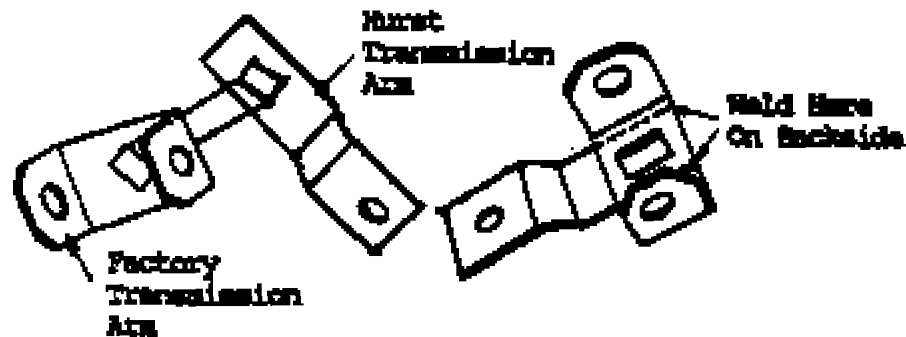
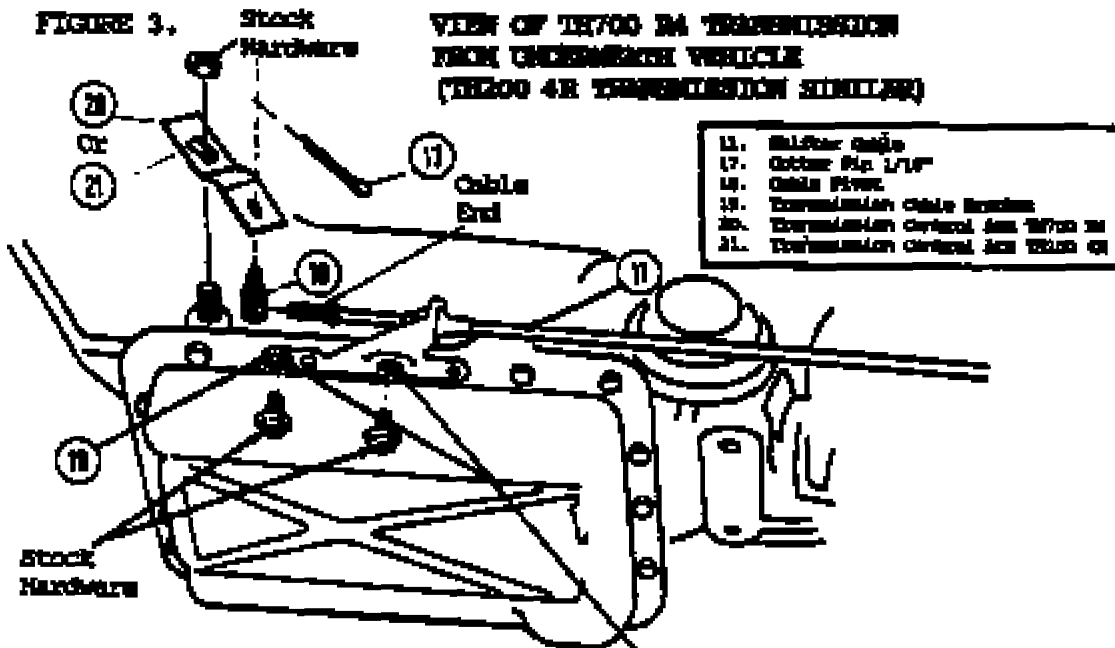


FIGURE 3.

Stock
Hardware

VIEW OF TH700 RA TRANSMISSION
FROM UNDERNEATH VEHICLE
(TH400 4R TRANSMISSION SIMILAR)

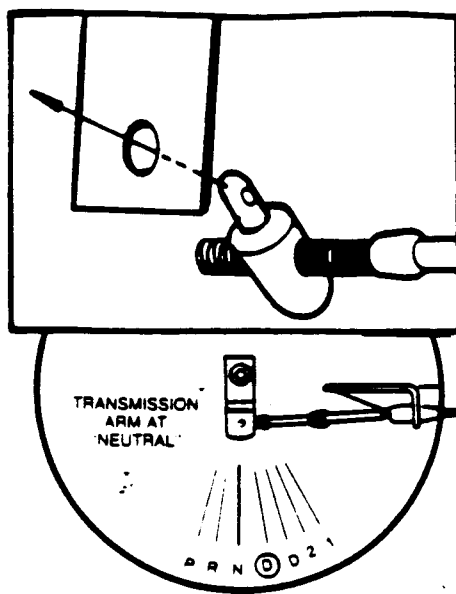


Adjustment slots for alignment
of shifter cable pivot to trans arm.

FIGURE 4.

ALIGNMENT PROCEDURE

1. Place shifter stick in "Neutral" position.
2. Position transmission arm at "Neutral" position.
3. Insert cable pivot into trans arm, secure with cotter pin.



IMPORTANT:

Cable pivot must line up properly with hole in transmission arm being able to slide in and out freely.

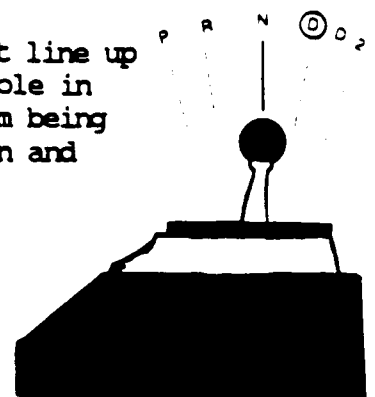


FIGURE 5.

PRO-MATIC 2 NEUTRAL/PARK START SAFETY SWITCH AND BACK-UP LIGHT SWITCH WIRING INSTALLATION

Original neutral safety switch wiring diagram shown is used in most vehicles. Refer to this diagram when wiring and connecting Hurst neutral/park start safety switch and back-up light switch.

ORIGINAL NEUTRAL SAFETY SWITCH

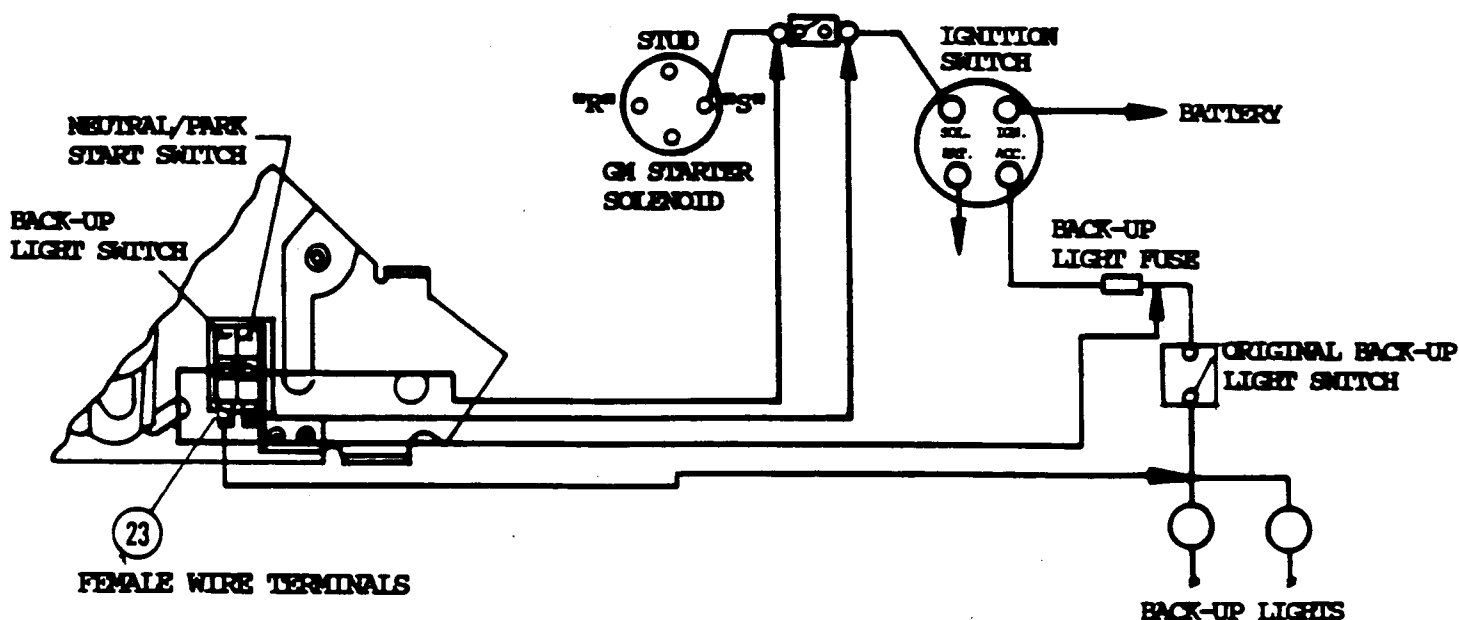


FIGURE 6.

SHIFTER OPERATION

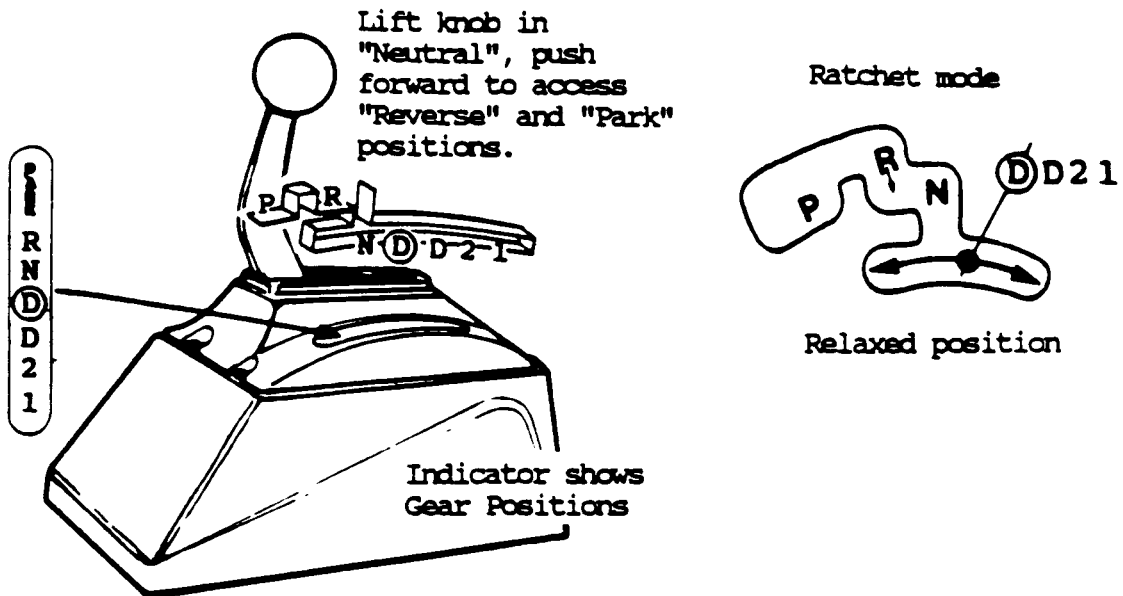
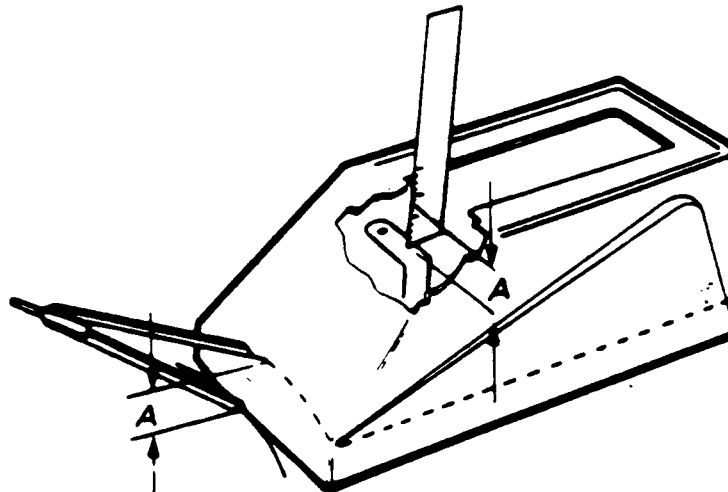


FIGURE 7.

CONSOLE MODIFICATION



1. Measure depth from top of shifter to below top of console.
2. Adjust points of divider to measured depth.
3. Scribe contours of floor along side of console as shown. Maintain divider in a perpendicular plane while scribing.
4. Trim portion below scribed line away. Fasten console to shifter with two #8 x 1-3/4" self-tapping screws.