



V-Matic 2 Shifter

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

Catalog #383 8521

Installation Instructions

Congratulations on your purchase of the...Hurst V-Matic 2, the finest dual action shifter available today with manual 4-speed styling. 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 V-Matic 2 Shifter

- * Trigger operated "Reverse Loc/Out", designed for street and strip applications.
- * Brushed aluminum Hurst "T" Handle.
- * Progressively illuminated gear indicator.
- * Engineered for years of precise trouble-free shifting.
- * Easy to install and complete with all mounting hardware required.

Before you begin installation of the V-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" 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 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 car 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 under 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 number (circled # in illustration) listed under IDENTIFICATION AND CONTENTS OF SHIFTER KIT.

INSTALLATION OF V-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. Turn ignition key to "Off" position on steering column and 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.

3. Place V-Matic 2 Shifter stick in "Neutral" position and carefully remove T-handle (Item #1) and rubber boot (Item #5). Lift console (Item #8) up and off.

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" and "Low" gear 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 #9) in selected location, mark and center punch four (4) mounting holes. Drill through floor tunnel using a 9/32" drill bit. Deburr holes with file and sand with emery cloth. (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 to accommodate cable 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 #14) 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 #10), 1/4" flatwashers (Item #20), and 1/4"-20 hex nuts (Item #16). Tighten securely. Install two (2) 1/4"-20 x 3/4" u-type clip fasteners (Item #11) onto front and rear console mounting tabs of shifter frame. 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 #27) for TH700 R4 Part No. 105 8567) or (Item #28 for TH200 4R Part No. 105 8572). These transmission arms must be installed with round hole 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) oil pan bolts (using 13mm socket) from left (driver) side of transmission as indicated. Attach Hurst cable bracket (Item #26) 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 and fasten using 1/4"-20 x 3/4" bolt (Item #15) and hex nut (Item #16). Attach cable end onto pin in shifter assembly and secure using 3/16" flatwasher (Item #17) and cotter pin (Item #18). (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 secure between two (2) internal tooth lockwashers and two (2) 7/16" hex nuts supplied on cable.

10. Make sure shifter stick is in "Neutral" position. Move transmission control arm on gear selector shaft in to "Neutral" position.

Thread cable pivot (Item #19) 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 end into transmission arm so pivot end is facing outward away from transmission. Temporarily install cotter pin (Item #18).

11. Cable Adjustment

If cable pivot end cannot be inserted into trans 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 cable away from the exhaust pipes and engine.

12. NEUTRAL/PARK START SWITCH WIRING CONNECTION

Important: The V-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 manufacturer's service manual of vehicle for the correct location.

Pre-wire Hurst neutral/park start switch (front switch located on shifter assembly) using two (2) female crimp connectors (Item #29) 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 start switch. Locate wire connected to "Solenoid" terminal of ignition switch and also trace to original neutral start 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 V-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 #29) 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 wire 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 manufacturer's service manual of vehicle 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 #12) 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. Temporarily thread shifter T-handle onto stick.

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 - 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. 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.

Remove one (1) #8 x 3/4" self-tapping screw (Item #3) that fastens boot retainer plate (Item #6) to console and separate.

Place console (Item #8) over shifter assembly and hold it level with shifter. For proper installation, the inside of console top must rest on the two (2) mounting tabs of shifter assembly (Refer to Figure 7).

Measure distance "A" from underside of console to the console mounting tabs 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. Drag dividers along floor tunnel and against console scribing a line on the console to match the contour of floor tunnel by keeping dividers perpendicular to floor tunnel.

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 area below scribed line. Remove any burrs or rough edges with a small file.

Install console over shifter assembly. Check the fit at floor tunnel and mounting tabs. If any additional trimming is necessary, do it at this time. Console should fit snugly against floor tunnel and shifter mounting tabs.

Before mounting the rubber boot onto console, the bottom flange must be trimmed. To do this place chrome boot retainer plate over rubber boot on a clean workbench or flat surface. Align holes in retainer plate with boot holes and mark with a pencil along both sides. Carefully trim rubber boot flange on pencil lines with a razor blade or scissors.

Remove T-handle and install rubber boot. Carefully stretch it over the trigger and onto the boot plate.

Install indicator lens onto the chrome boot retainer plate from bottom side, use lens clamp (Item #21) and two (2) #10-32 x 3/8" machine screws (Item #22). Tighten screws loosely so gear indicator lens slides back and forth easily.

Place retainer plate over boot and align holes with boot and console. Install two (2) #8 x 1-3/4" self-tapping screws (Item #4) in top right and left rear through boot retainer plate, rubber boot, console, and shifter frame. Snug them down but do not install the remaining screws until gear indicator light position is checked.

Thread T-handle onto shifter stick, turn to desired position and tighten jam nut against handle. Shifter can now be checked for gear indicator alignment. Turn "On" instrument panel lights to check operation and alignment of illuminated gear indicator lamp with indicator lens. Place stick in "Neutral" position. Slide indicator lens back and forth until "N" located on indicator lens is aligned with illuminated gear indicator lamp. Tighten two (2) #10-32 x 3/8" machine screws securely. Install five (5) #8 x 3/4" self-tapping screws (Item #3) through boot retainer plate, rubber boot and console. Tighten securely.

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 trigger must be lifted to clear the safety stop between "Park" and "Reverse". Pull stick straight back to engage "Reverse". Once in "Reverse" the handle must be pushed down, then the shifter is ready for a straight pull back to "Neutral".

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 has a straight gate and ratchet gate gear selection mode.

When "Neutral" is engaged, you have the choice of either pulling stick straight back to (D) - D - 2 or 1 gear positions or instead push down on the stick then pull straight back into the ratchet mode of (D) - D - 2 or 1 gear positions. In this ratchet mode, pull stick straight back to "Overdrive" Drive 4. Release stick and shifter will return to a relaxed position. Pull back to engage Drive 3. Release and pull back to engage Drive 2. Release and pull back to engage Drive 1 - Low gear position.

To upshift, push the stick forward until it stops and release. This procedure must be done for each gear until "Neutral" is reached. At this time, the stick will spring upward. To engage "Reverse" the trigger must be lifted with two fingers and the stick pushed forward. To shift into "Park", lift trigger and push stick forward to stop position. Release trigger, "Park" is now secured.

Note: Forward gear selections utilize a straight gate and ratchet gate gear shift mode. When in the ratchet gate mode, shifter stick must return to a relaxed position before another gear selection can be completed.

DOWN SHIFTING - Straight Gate Shift Mode

- | | |
|--------------------------------|---|
| Park to Reverse | - Lift trigger, pull stick back to next detent for "Reverse". |
| Reverse to Neutral | - Push stick down, pull straight back to next detent for "Neutral". |
| Neutral to Drive 4 "Overdrive" | - Pull back to next detent for Drive 4 "Overdrive". |
| Drive 4 "Overdrive" to Drive 3 | - Pull back to next detent for "Drive 3". |
| Drive 3 to Drive 2 | - Pull back to next detent for "Drive 2". |
| Drive 2 to Drive 1 | - Pull back to stop position for "Drive 1". |

UP SHIFTING - Straight Gate Shift Mode

- Drive 1 to Drive 2 - Push stick forward to next detent for "Drive 2".
- Drive 2 to Drive 3 - Push stick forward to next detent for "Drive 3".
- Drive 3 to Drive 4 "Overdrive" - Push stick forward to next detent for Drive 4 "Overdrive".
- Drive 4 "Overdrive" to Neutral - Push stick forward to next detent for "Neutral".
- Neutral to Reverse - Lift trigger, push stick forward to next detent for "Reverse".
- Reverse to Park - Lift trigger, push stick forward to next detent 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

FIGURE 6.

SHIFTER OPERATION

Lift trigger, push stick forward to next detent for "Reverse" and "Park".

P
R
N
D
2
1

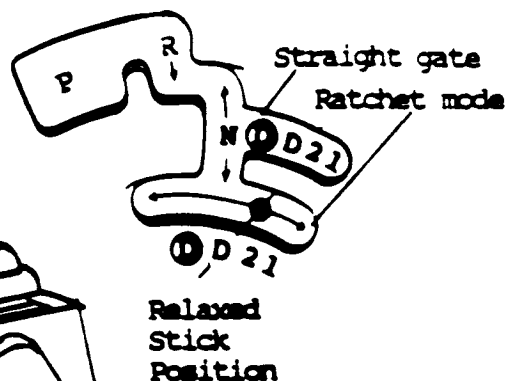
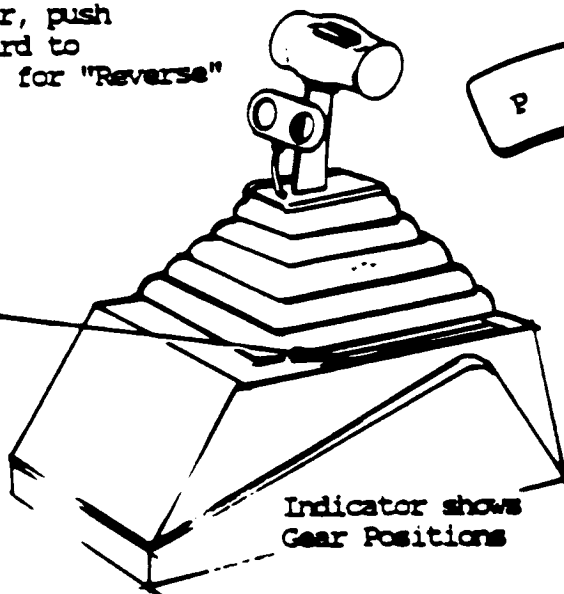
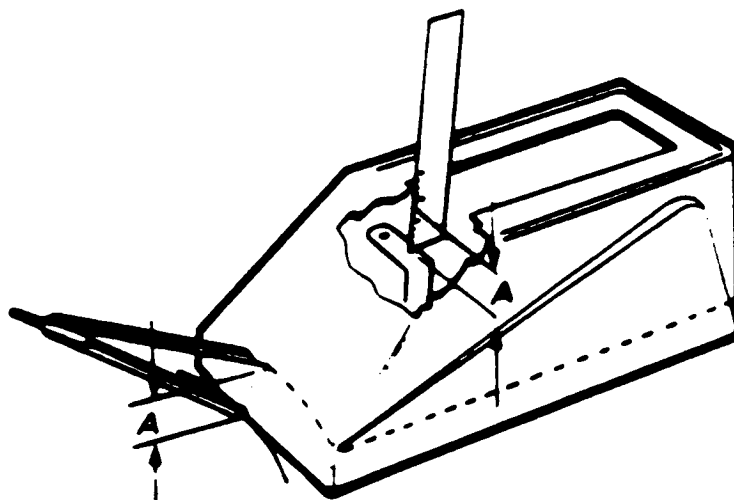


FIGURE 7.

CONSOLE MODIFICATION

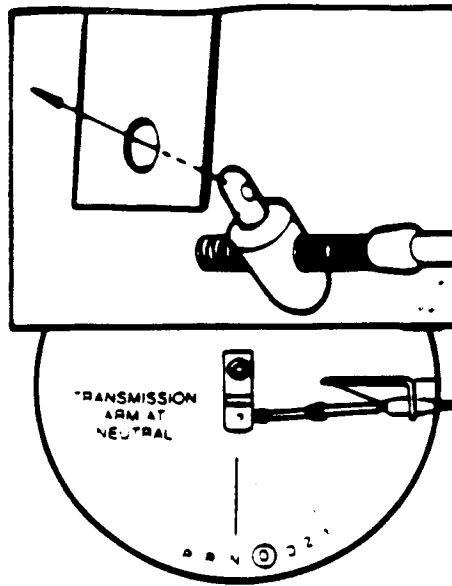


1. Measure depth from top of shifter to below top of console.
2. Adjust points of divider to measured depth.
3. Scribe contours of floor along side of console as shown. Maintain divider in a perpendicular plane while scribing.
4. Trim portion below scribed line away. Fasten console to shifter with two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

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.

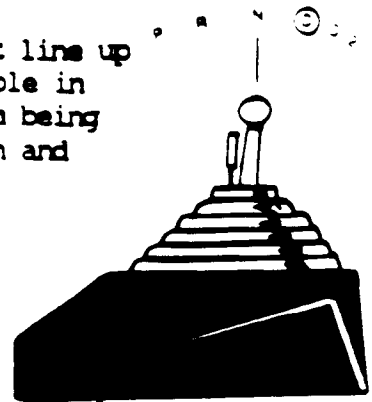


FIGURE 5.

PRO-10TIC 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

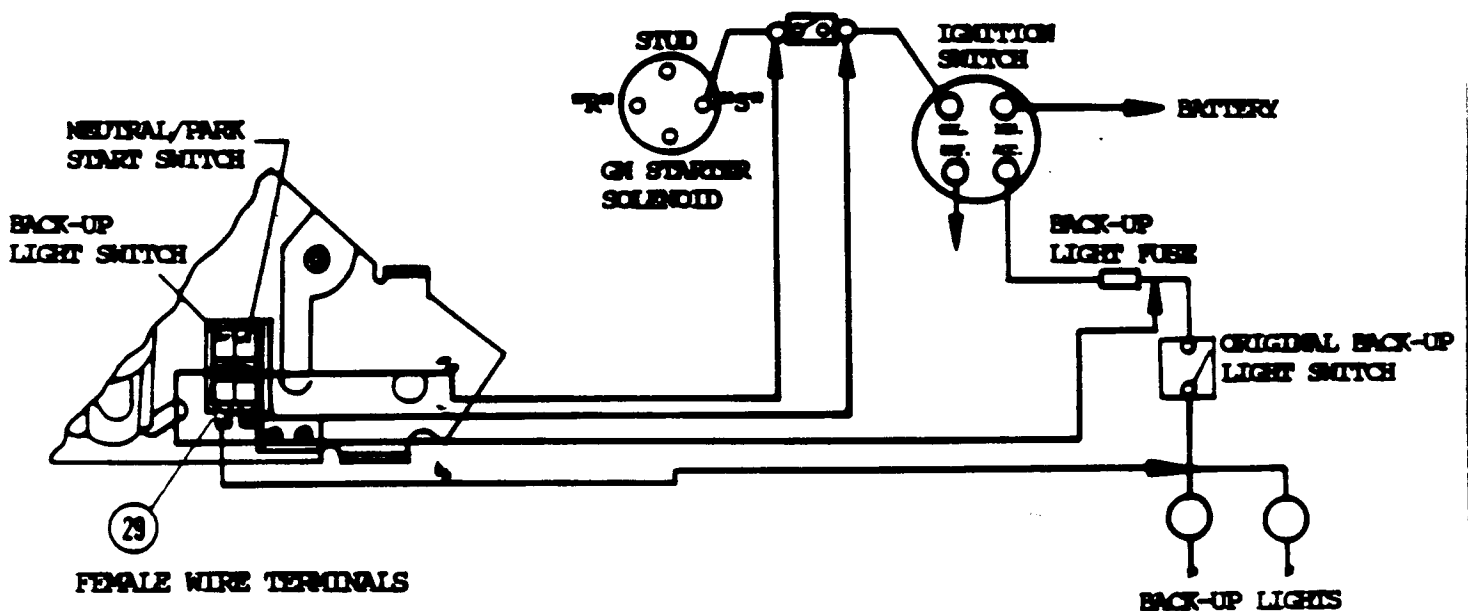


Figure 1. TOP VIEW OF SHIFTER MOUNTING AND CABLE MOUNTING HOLE PATTERNS

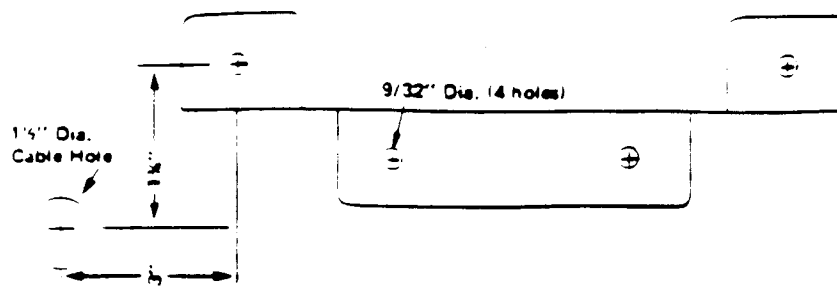


Figure 2. POSITION OF FACTORY TRANS ARM ON TO HURST TRANS ARM FOR WELDING OPERATION

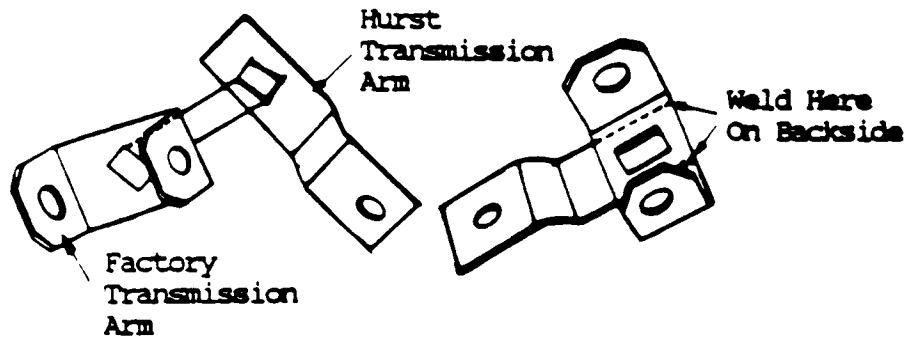
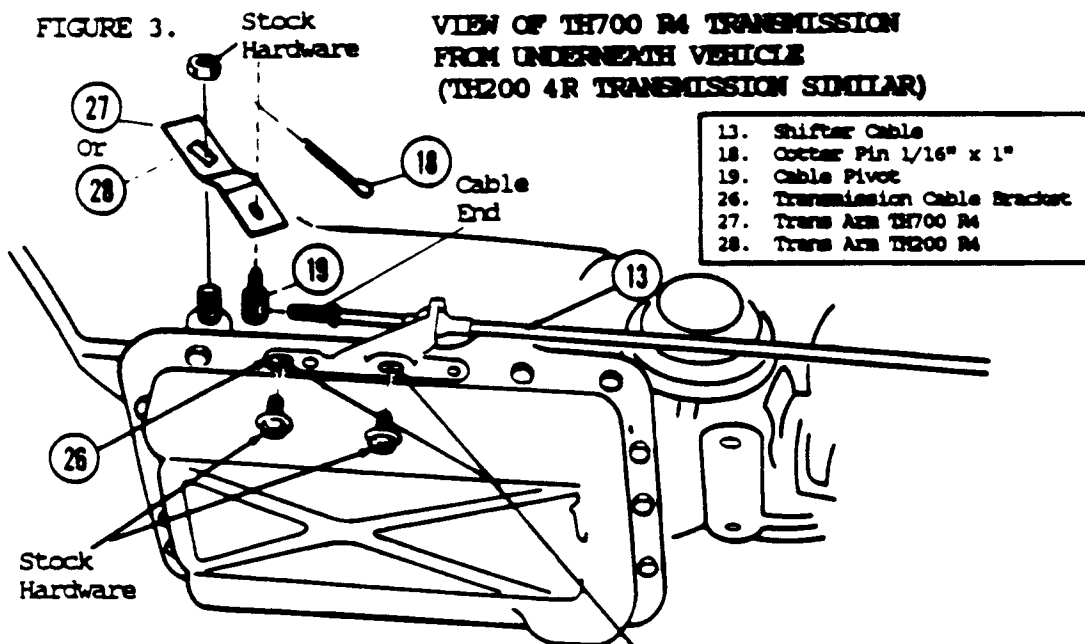
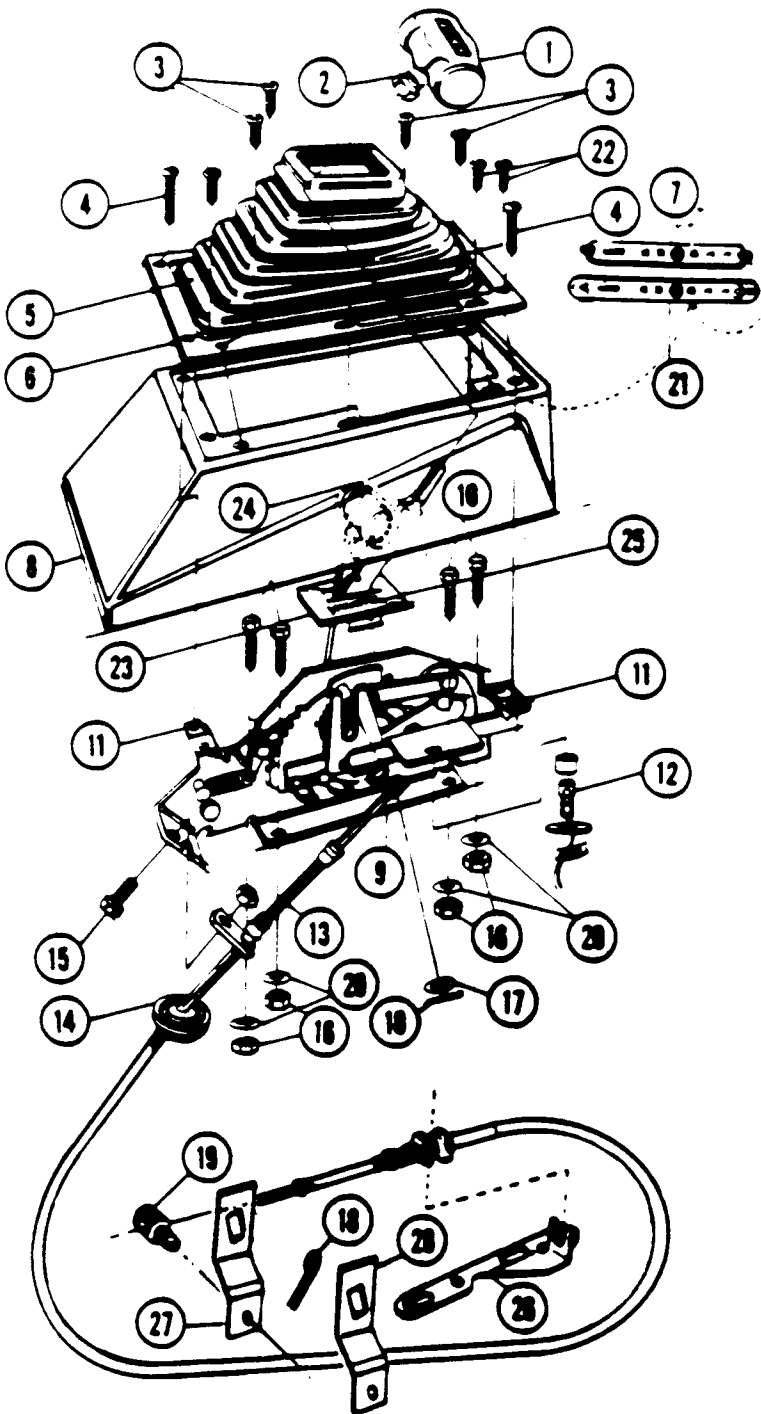


FIGURE 3. Stock Hardware VIEW OF TH700 R4 TRANSMISSION FROM UNDERNEATH VEHICLE (TH200 4R TRANSMISSION SIMILAR)



IDENTIFICATION AND CONTENTS OF SHIFTER KIT



1.	T-Handle	PN.	150 4810
2.	Jam Nut	PN.	179 4713
3.	Self-Tapping Screw #8 x 3/4"	PN.	97091105
4.	Self-Tapping Screw #8 x 1-1/4"	PN.	97091106
5.	Rubber Boot	PN.	97091214
6.	Boot Retainer Plate-Chrome	PN.	135 8574
7.	Indicator Lens	PN.	169 1006
8.	Console	PN.	129 8554
9.	Shifter Assembly	PN.	181 1509
10.	Hex Bolt 1/4" -20 x 1"	PN.	97080969
11.	1/4" -20 x 3/4" U-Type Clip Fastener	PN.	97091081
12.	Indicator Lamp Assembly	PN.	117 9048
13.	Shifter Cable	PN.	500 3555
14.	Rubber Grommet (Floor Tunnel)	PN.	97091109
15.	Hex Bolt 1/4" -20 x 3/4"	PN.	97090029
16.	Hex Nut 1/4" -20	PN.	97000910
17.	Flat Washer 3/16"	PN.	97000905
18.	Cotter Pin 1/16" x 1"	PN.	97091086
19.	Cable Pivot	PN.	97091089
20.	Flatwasher 1/4"	PN.	97000818
21.	Lens Clamp	PN.	97091213
22.	10-32 x 3/8" Machine Screw	PN.	97091215
23.	Boot Plate	PN.	97091204
24.	Trigger	PN.	107 8576
25.	V-Metric Decal	PN.	97091214
26.	Transmission Cable Bracket	PN.	117 4778
27.	Trans Arm TH700 R4	PN.	105 8567
28.	Trans Arm TH200 4R	PN.	105 8572
29.	Female Wire Connector	PN.	252 7600

Note: Female wire connector (Item #29) is not shown. Refer to Figure 5.