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Cable Operated Sensor Kit Installation Instructions for Ford AOD, 4R70W, and AODE with LCD Decoder Box

General Installation Notes:

Please read these instructions completely before beginning the installation. If you have any questions, please call.

Before beginning the installation, disconnect the negative battery cable and use wheel chocks to block the vehicle's wheels. Do not attempt to install this product while the engine is running.

Make sure the engine, transmission, body, and frame are properly grounded. We recommend applying anti-seize lubricant to all aluminum threads before final assembly.

All Lokar Installation Instructions can be found by visiting www.lokar.com/instructions.html.

Refer to Fig. 1, 2 and 3 for the component names.

NOTE: There are several generations of decoder boxes, and they each require different instructions. If your decoder box looks different than Fig. 3, visit the Lokar website as listed above to locate the correct instructions, or contact Lokar by phone or email.

MOUNTING OPTIONS: The Lokar Cable Operated Sensor Kit is equipped to mount the sensor either on the passenger side of the transmission using the sensor bracket, or in a remote location within 5 feet of the transmission selector shaft using the provided universal mounting bracket.

To mount the sensor remotely inside the vehicle, a Lokar Remote Mounting Cable Kit (part # CINR-1796) will be required. This extends the cable 7 feet, for a total of 12 feet.

The decoder box should always be mounted inside the vehicle and out of the elements.

Step 1: Assemble the upper and lower parts of the adjustable cable mounting bracket by installing two #8-32 x 5/16" button head screws and lock washers using a 5/32" Allen wrench. Do not fully tighten the screws yet. The orientation of the upper part of the adjustable cable mounting bracket will depend on the orientation of the trans arm on your selector shaft. See Fig. 4.

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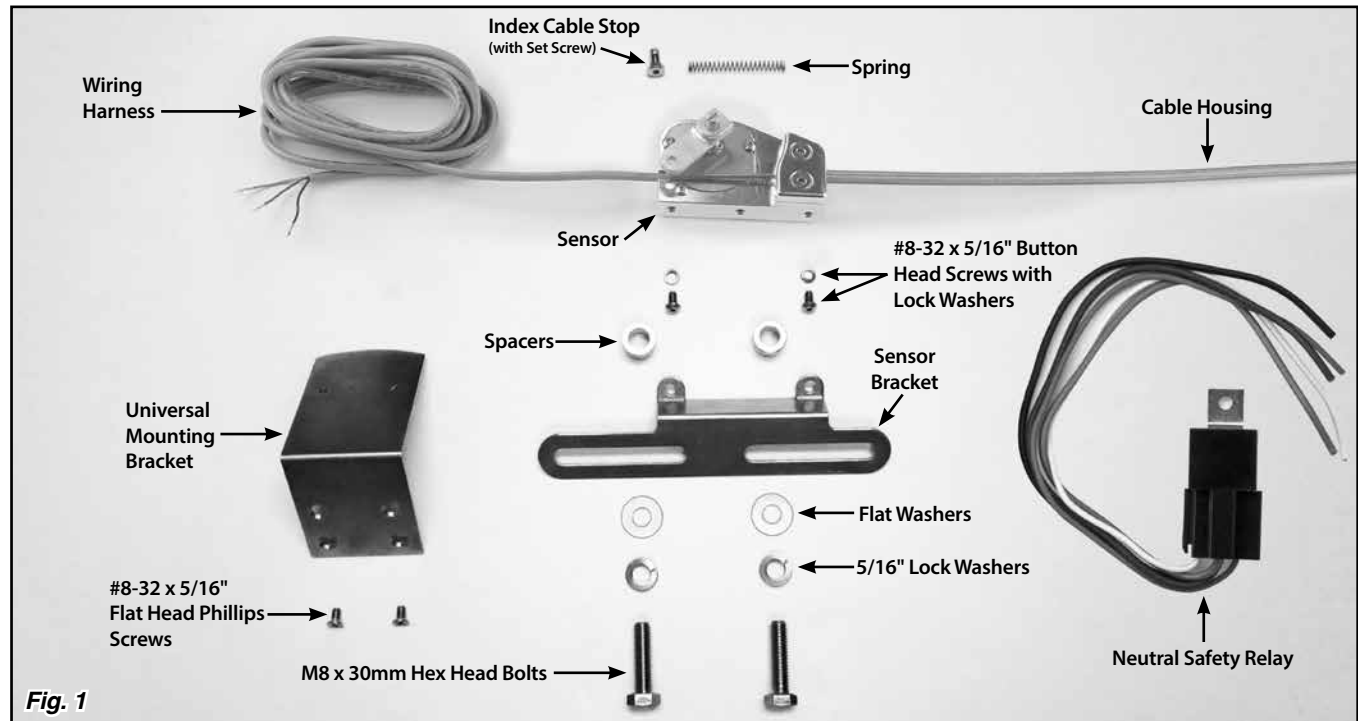


Fig. 1

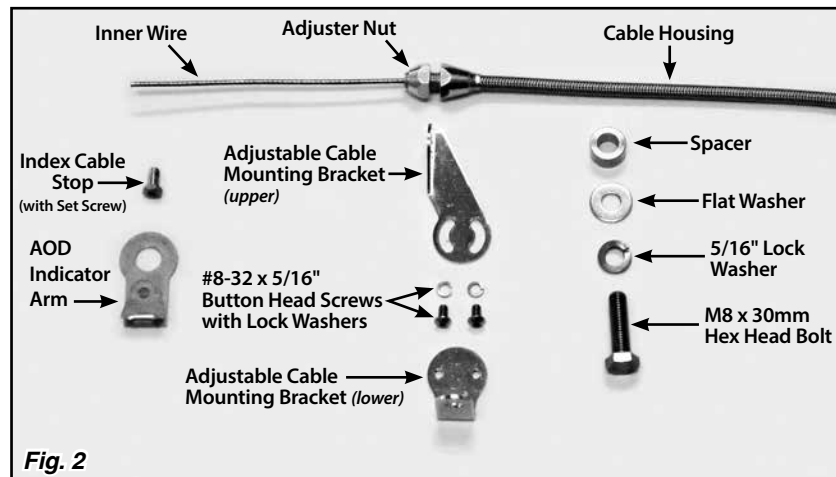


Fig. 2

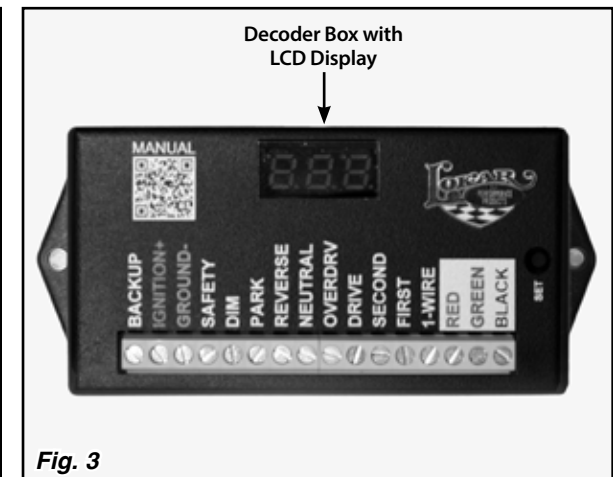


Fig. 3

Adjustable Cable Mounting Bracket with Trans Arm Pointed UP



Fig. 4

Adjustable Cable Mounting Bracket with Trans Arm Pointed DOWN

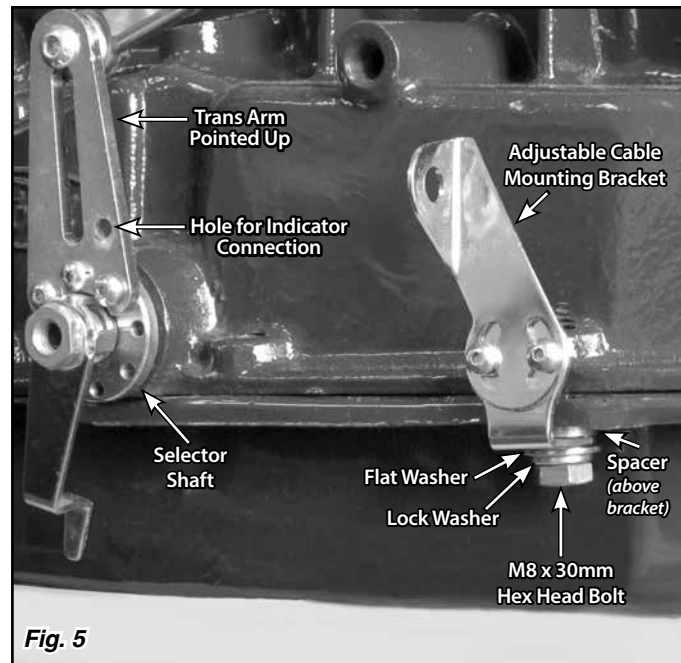


Fig. 5

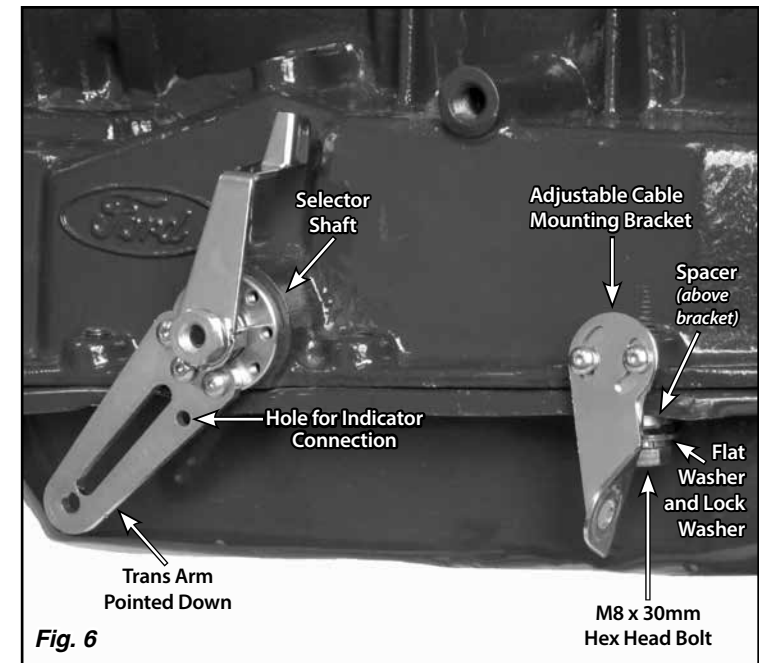


Fig. 6

NOTE: If installing a Cable Operated Sensor on a transmission that has a Lokar Cable Operated Shifter, position the sensor's Adjustable Cable Mounting Bracket underneath the shifter's Lower Cable Mounting Bracket.

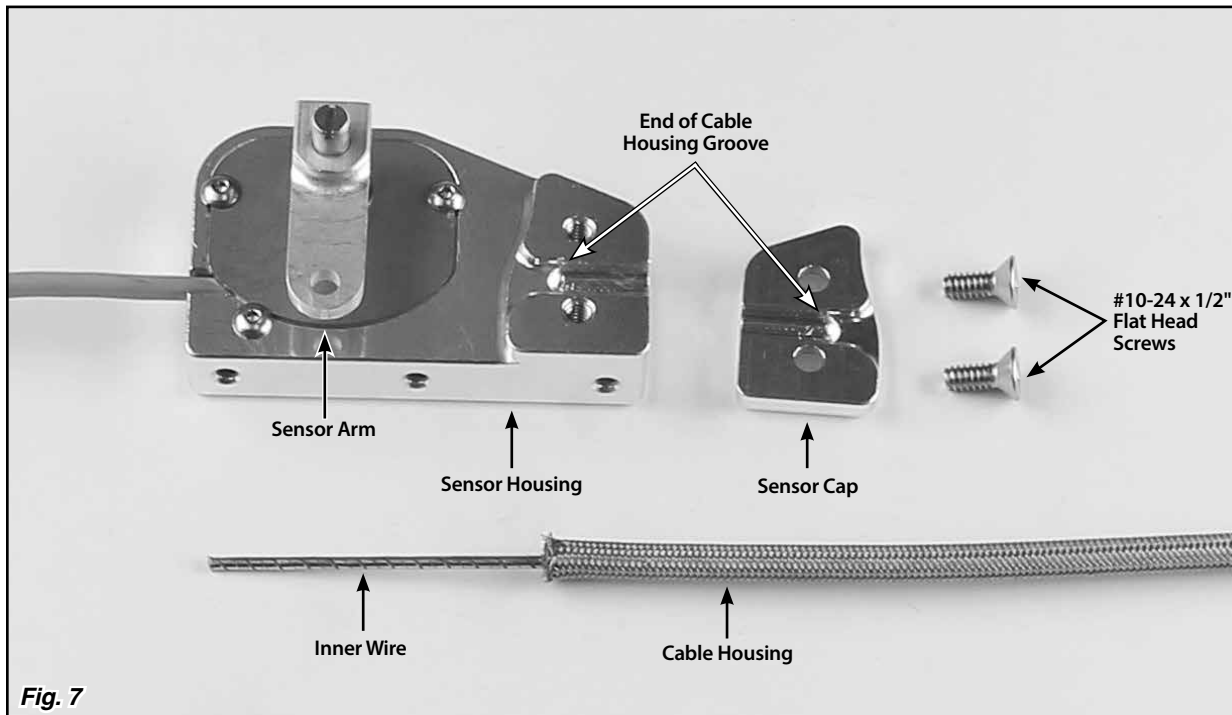


Fig. 7

Step 2: Remove the second pan bolt to the rear of the selector shaft. Install the adjustable cable mounting bracket there using the provided M8 x 30mm hex head bolt, lock washer, flat washer, and spacer. **Fig. 5 and Fig. 6**

NOTE: If you have an aluminum transmission pan, the spacer may not be required.

Step 3: Remove the sensor cap by removing the two #10-24 x 1/2" flat head screws using a 1/8" Allen wrench and separate the cable housing from the sensor. **Fig. 7**

Step 4: Make sure the sensor arm is parallel to the slot in the sensor shaft, with the set screw in the top of the sensor arm aligned with the slot. If it is not, loosen the set screw in the top of the sensor arm using a 1/16" Allen wrench, and adjust the position of the sensor arm on the shaft. **Fig. 8**

Step 5: This step varies, depending on where you are mounting the sensor as described below:

- **Directly onto the passenger side of the transmission:** Use the provided M8 x 30mm hex head bolts, lock washers, flat washers, and spacers to mount the sensor and sensor bracket to the first and second pan bolt to the rear of the dipstick tube. **NOTE:** If you have an aluminum transmission pan, the spacers may not be required.

Adjust the sensor and sensor bracket forward or backward until you can move the sensor arm through its full range of travel without the sensor arm interfering with the transmission case. Tighten the M8 x 30mm hex head bolts used to mount the sensor bracket. **Fig. 9**

- **In a remote location:** Make sure the sensor is close enough the cable housing can be routed into the back side of the adjustable cable mounting bracket. Install the universal mounting bracket onto the vehicle using the two smaller holes in the bracket and your choice of fasteners (not included). The small holes in the universal mounting bracket may be drilled out larger if needed. Once the bracket is installed in the remote location, remove the sensor from the other sensor bracket. Install the sensor onto the universal mounting bracket, using the #8-32 x 5/16" flat head Phillips screws. There are two pairs of countersunk holes on the universal mounting bracket and three holes in the sensor to allow for different mounting positions.

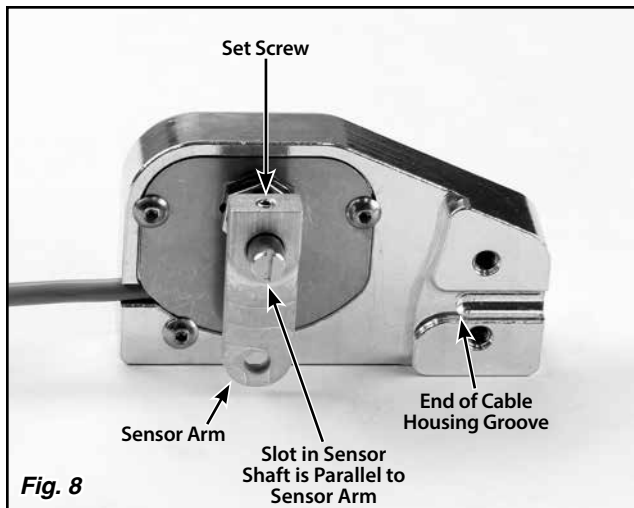


Fig. 8

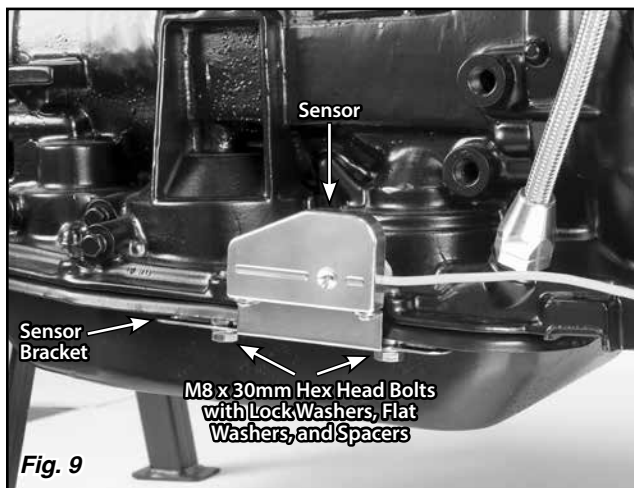


Fig. 9

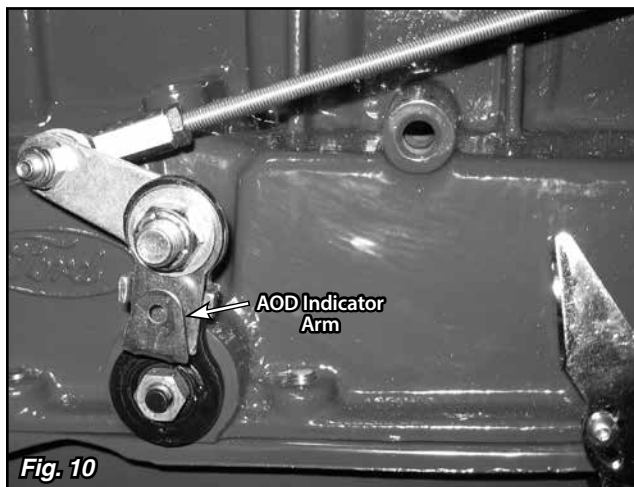


Fig. 10

Step 6: This step also varies depending on what selector shaft is installed in the transmission.

- **With a Lokar selector shaft:** The trans arm has a 3/16" diameter hole in it for the indicator cable to connect to. Make sure this hole is to the rear of the slot in the trans arm. If it is not, remove the trans arm and re-install it with the 3/16" hole to the rear of the slot in the trans arm. **Fig. 5 and Fig. 6**
- **With any type of selector shaft EXCEPT a Lokar selector shaft:** Install the AOD indicator arm onto the trans arm. The open part of the "J" shape in the AOD indicator arm should face away from the selector shaft. **Fig. 10**

Step 7: Remove the inner wire from the cable housing. Temporarily install the threaded end of the cable housing into the adjustable cable mounting bracket and secure it with the adjuster nut.

The cable is designed to be cut-to-fit. Route the cable housing from the adjustable cable mounting bracket to the sensor.

There is a groove in the sensor housing the end of the cable housing fits in to. Mark the cable housing at the end of the cable housing groove. Remove the cable housing from the adjustable cable mounting bracket. **Fig. 7 and Fig. 8**

Step 8: **Make sure the inner wire has been removed from the cable housing.** Wrap tape around the area to be cut and use a cutoff wheel or fine-toothed hacksaw to cut the cable housing at your mark. You also may use heavy duty 8" diagonal cutting pliers. Lokar recommends Klein brand Diagonal Cutting Pliers # D2000-28 available at The Home Depot or through W. W. Grainger, Part # 4A838.

Before moving forward, make sure the end of the cable housing you just cut is open and the inner wire will slide in without interference.

Step 9: Remove the sensor from the sensor bracket using a 5/32" Allen wrench. Reattach the cable housing to the sensor by clamping it between the sensor housing and the sensor cap, making sure the cable housing does not extend beyond the end of the cable housing groove in the sensor housing. Secure the sensor cap using the #10-24 x 1/2" flat head screws you removed earlier. Then, install the threaded end of the cable housing back into the adjustable cable mounting bracket.

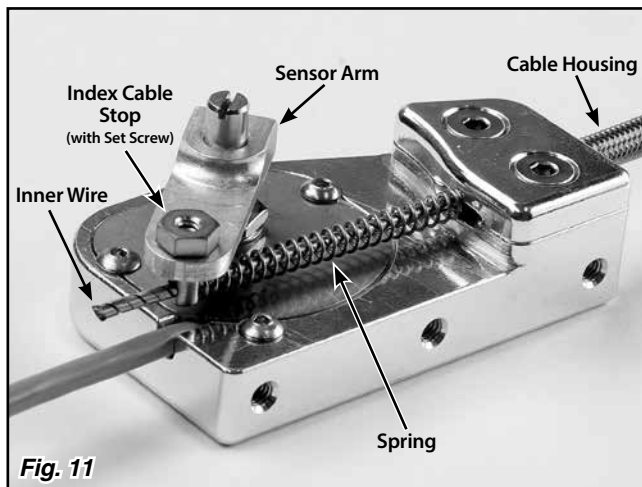


Fig. 11

Step 10: Slide the inner wire into the cable housing until it is protruding from both ends. Put the spring on the inner wire between the sensor arm and the sensor cap.

Install the index cable stop into the sensor arm with the cable hole between the sensor arm and the sensor. Slide the inner wire through the index cable stop, so at least 1" is protruding beyond the index cable stop. Make sure the inner wire is on the correct side of the sensor arm. **Fig. 11**

Step 11: Reinstall the sensor onto the sensor bracket using the #8-32 x 5/16" button head screws and lock washers (transmission mounted sensor bracket) or the #8-32 x 5/16" flat head Phillips screws (universal mounting bracket).

Step 12: At the opposite end of the cable, install the index cable stop into the trans arm or the AOD indicator arm. Slide the inner wire through the hole in the index cable stop so approximately 1" is protruding. You should now have excess inner wire at the opposite end of the cable (at the sensor).

There is a set screw in the hex end of the index cable stop on the trans arm or the AOD indicator arm. Tighten the set screw using a 1/16" Allen wrench. Adjust the angle of the adjustable cable mounting bracket so the inner wire will not bind or kink as it goes through the gear selections. **Fig. 12 and Fig. 13**

Note: **It is very important the cable housing is secured. Fasten the cable housing tightly so there is no slack or movement in the cable housing.**

Step 13: Make sure the transmission is in Park.

- **All applications with the trans arm pointing UP:** Push the sensor arm up against the spring, so the spring is compressed approximately 1/8" at rest in Park. **Fig. 14** While holding that position, tighten the set screw in the index cable stop on the sensor arm using a 1/16" Allen wrench.

- **All applications with the trans arm pointing DOWN:** Push the sensor arm as far as it will go until the spring is completely compressed. Then, let the spring expand approximately 1/8". **Fig. 15** While holding that position, tighten the set screw in the index cable stop on the sensor arm using a 1/16" Allen wrench.

Step 14: Trim the excess inner wire, leaving about 1" protruding. Shift the transmission from Park, one gear at a time, and check each gear to make sure the arm on the sensor does not hit anything and the sensor does not bottom out on its internal stops. The sensor arm does not need to be the same distance from the stops in Park as it is in low gear. If the sensor bottoms out on its internal stop before the shifter reaches first gear, loosen up one end of the inner wire at either of the index cable stops and move the trans arm/AOD indicator arm or sensor arm. **Make sure you maintain at least 1/8" or more of compression on the spring at the sensor end of the cable when the transmission is in Park (applications with the trans arm pointed up) or Low gear (applications with the trans arm pointed down).**

Once the sensor is operating properly and no more adjustments need to be made, cut the excess inner wire within 1/2" of the index cable stop on both ends of the cable.

Mounting the Decoder Box

The decoder box must be mounted in a dry place. When mounting this unit, keep it within reach of the wires on the LED display and the sensor. The decoder box can be mounted with two screws or double-sided tape. Be sure it is still accessible for connecting the wiring and for programming later.

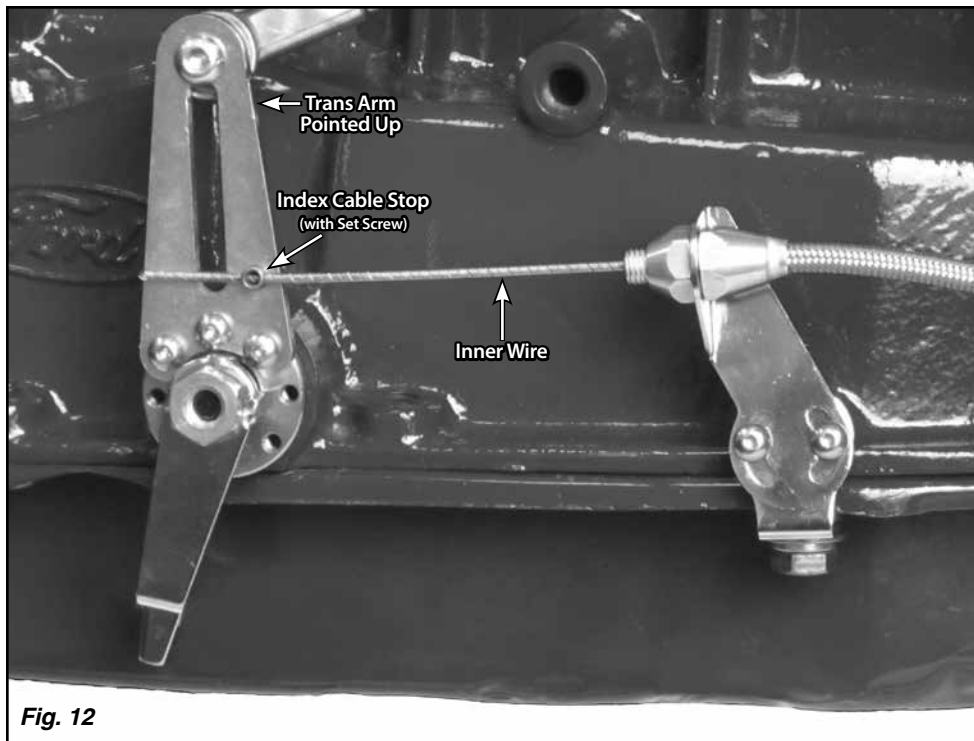


Fig. 12

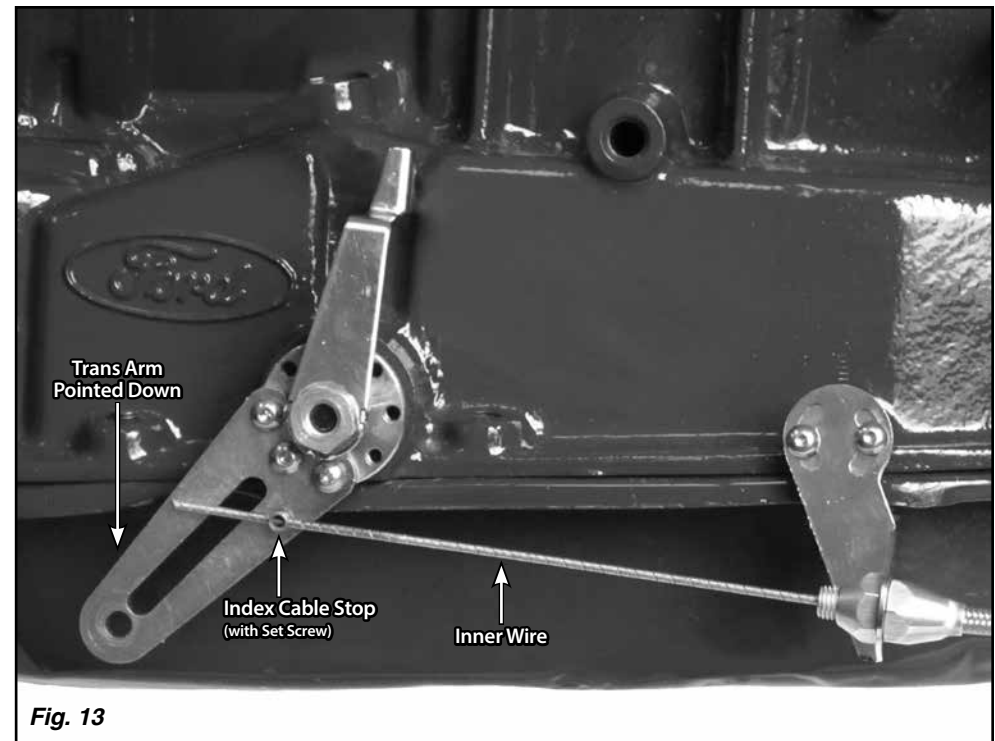


Fig. 13

Applications with Trans Arm Pointed UP

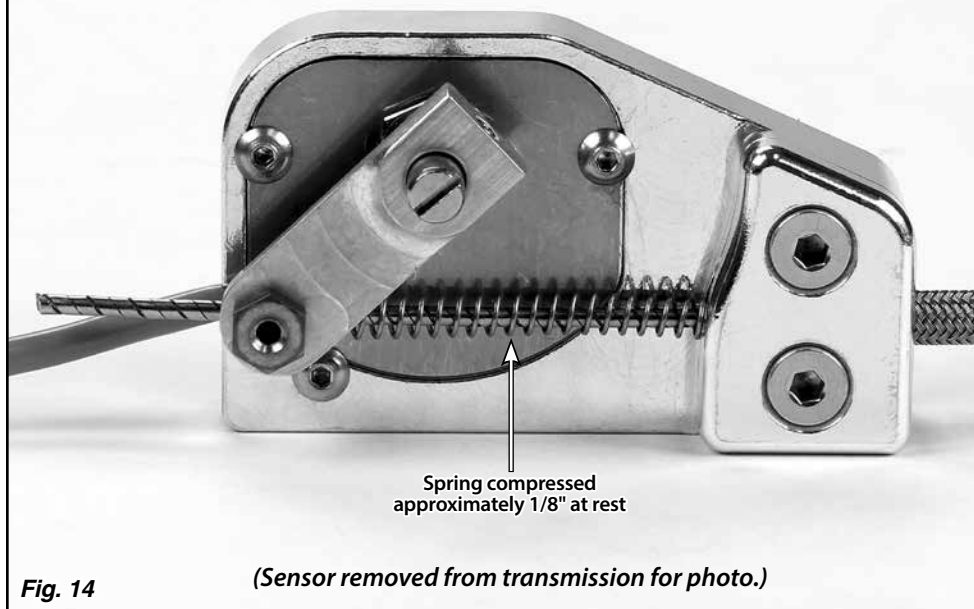


Fig. 14

Applications with Trans Arm Pointed DOWN

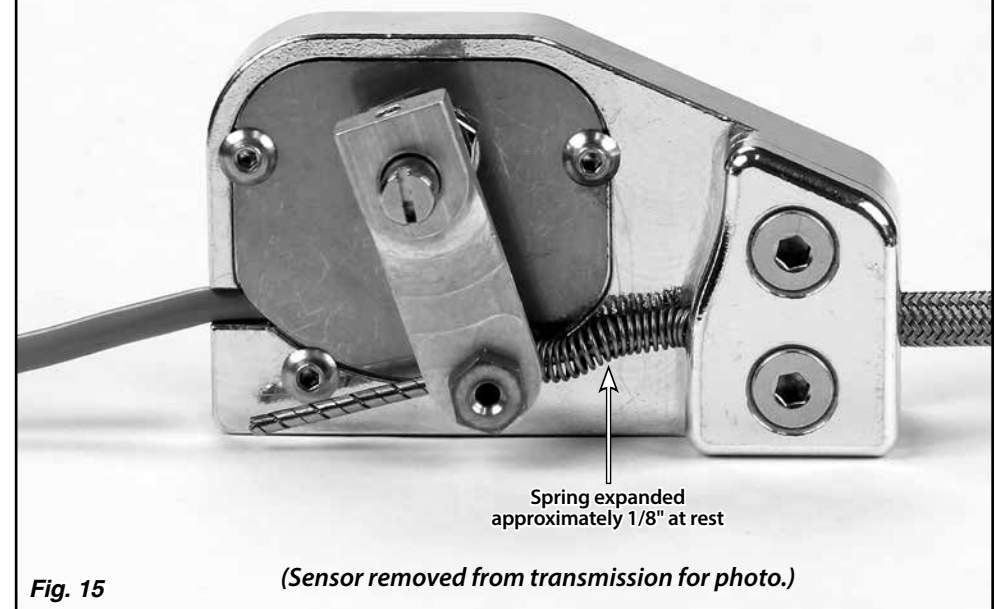


Fig. 15

Wiring the Sensor and the Decoder Box

The sensor has a 10 foot long cable attached to it. This cable contains three wires which connect to the decoder box: one red, one green or white, and one black. To connect the wires to the decoder box, use a small flat blade screwdriver to loosen the screw terminal. Strip 3/8" of the insulation off each of the wires. Connect the red wire to the terminal marked RED. Connect the green or white wire to the terminal marked GREEN. Connect the black wire to the terminal marked BLACK. **Fig. 16**

NOTE: The red, green or white, and black wires on the sensor should ONLY be connected to the terminals marked "RED", "GREEN", or "BLACK" on the decoder box. DO NOT connect any of these three wires to the "IGNITION+" or "GROUND-" terminals on the decoder box.

Wiring a Lokar Three-Wire LED Indicator

Locate a fused (15A), switched 12V + power source that supplies power when the ignition key is in the "ON" or "RUN" position, but does not supply power when the key is off. **(NOTE: If you are going to use the optional Neutral Safety Relay discussed later, this wire will also need to supply power while the key is in the "START" position.)** Run a red wire (not supplied) from that power source to the decoder box. Join the end of that wire to the end of the red wire from the LED indicator. Insert the joined end of those wires into the "IGNITION+" terminal on the decoder box and tighten the terminal screw.

Connect one end of a black wire (not supplied) to a solid chassis ground. Join the other end of that wire to the black wire from the LED indicator. Insert the joined end of those wires into the "GROUND-" terminal on the decoder box and tighten the terminal screw. **Fig. 16**

NOTE: When you are finished with this step, there will be two (2) wires connected to the "IGNITION+" terminal on the decoder box, and two (2) wires connected to the "GROUND-" terminal on the decoder box.

If installing a Lokar Three-Wire LED Indicator, DO NOT connect the remaining green or white wire from the LED Indicator to the decoder box until you have programmed the gear positions.

Programming the Gear Positions

Programming is done using the push-button SET switch on the top of the decoder box and watching the 3-digit LCD display on the decoder box.

The programming sequence must be completed without interruption for the settings to be saved. If you stop or turn the key off at any point during the programming sequence, you will have to start over from the beginning.

If -E- is showing on the display it indicates the sensor did not move while trying to program a new gear position.

Step 1: Place the transmission in Park and make sure the key is off. Reconnect the negative battery cable.

Step 2: Press and hold the SET switch. **Fig. 16** Turn the ignition key on while holding the SET switch down. The display will show SE-.

Step 3: Release the switch. The display will now show the current output setting, either L- for ground outputs or HI for 12V+ outputs. Tap the SET switch to change between the output types. Lokar Indicators require ground outputs, so set the decoder box to L- if you are using a Lokar brand Indicator. Most other brand indicators require 12v+ outputs, so set it to HI for most others (check your indicator manufacturer's instructions).

Step 4: Once you have the correct output setting, press and hold the SET switch for about three seconds until the display goes blank. This will save the output setting.

Step 5: Release the SET switch when the display goes blank. The display will now show P-L for **PARK** with ground outputs or P-H for **PARK** with 12V+ outputs.

Step 6: Press and hold the SET switch for about three seconds until the display goes blank.

Step 7: Release the SET switch. The display will show r-L for **REVERSE** with ground outputs or r-H for **REVERSE** with 12V+ outputs.

Step 8: Shift the transmission to **REVERSE**.

Step 9: Press and hold the SET switch for about three seconds until the display goes blank.

Step 10: Release the SET switch. The display will show n-L for **NEUTRAL** with ground outputs or n-H for **NEUTRAL** with 12V+ outputs.

Step 11: Shift the transmission to **NEUTRAL**.

Step 12: Press and hold the SET switch for about three seconds until the display goes blank.

Step 13: Release the SET switch. The display will show o-L for **OVERDRIVE** with ground outputs or o-H for **OVERDRIVE** with 12V+ outputs.

Step 14: Press and release the SET switch one time.

Step 15: The display will show d-L for **DRIVE** with ground outputs or d-H for **DRIVE** with 12V+ outputs.

Step 16: Shift the transmission to Overdrive.

Step 17: Press and hold the SET switch for about three seconds until the display goes blank.

Step 18: Release the SET switch. The display will show 2-L for **SECOND** with ground outputs or 2-H for **SECOND** with 12V+ outputs.

Step 19: Shift the transmission to Drive.

Step 20: Press and hold the SET switch for approximately 3 seconds, until the display goes blank.

Step 21: Release the SET switch. The display will show 1-L for **FIRST** with ground outputs or 1-H for **FIRST** with 12V+ outputs.

Step 22: Shift the transmission to First gear.

Step 23: Press and hold the SET switch for approximately 3 seconds, until the display goes blank.

Step 24: Release the SET switch, and don should show on the display. If it does not, press and release the SET switch until it does. **When don shows up on the display, press and hold the SET switch until the display goes blank.**

Step 25: Following the wiring diagram in **Fig. 17** for your type of Indicator, connect the rest of the wires from the LED Indicator to the decoder box.

Changing the LED Colors and Intensity

NOTE: The following procedure ONLY APPLIES to Lokar 3-Wire Indicators. Lokar 6-Wire Indicators cannot change color or intensity.

Step 1: To enter the color setup mode, put the transmission in Park and turn the ignition key to ON, but do not start the engine.

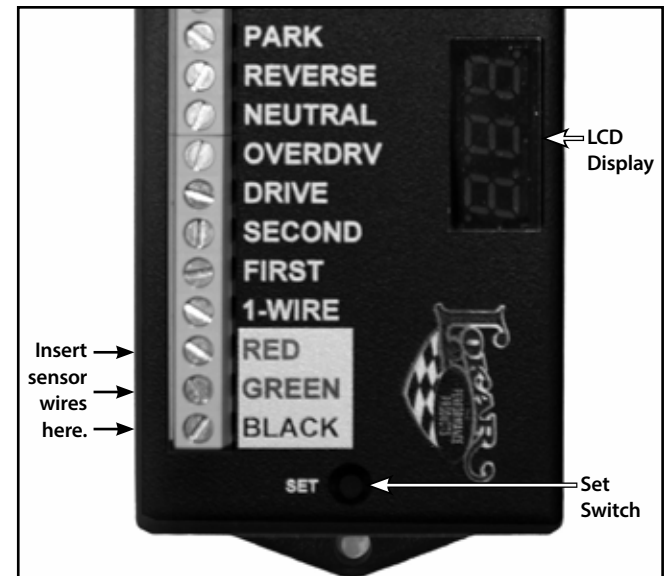
Step 2: With the ignition ON, press and hold the SET switch on the decoder box until LL- is shown on the display.

Step 3: Release the SET switch. The display will show P- and the **PARK** position will be illuminated on the LED Boot or Dash gear Indicator.

Step 4: The **PARK** position on the Indicator will now be lit with the current color setting for **PARK**. To change the color, tap the SET switch (less than one second). The **PARK** position on the Indicator will cycle to the next color in this order: red, green, blue, magenta, cyan, and orange. Continue tapping the SET switch until the **PARK** position on the Indicator is lit with the desired color.

Step 5: Once the **PARK** position on the Indicator is lit with the desired color, press and hold the SET switch to save the setting for **PARK**.

Step 6: Release the SET switch. The display will now show r- and the **REVERSE** position on the Indicator will now be lit with the color setting for **REVERSE**.



NOTE: Some indicator sensors come with a white wire instead of a green wire. If your sensor has a white wire, connect it to the terminal labeled GREEN.

Fig. 16

Step 7: Follow the above procedure for each gear position, tapping the SET switch to cycle through to the desired color on the Indicator, holding the SET switch to save the setting, and releasing the SET switch to advance to the next gear position. When you reach **OVERDRIVE**, press and hold the SET switch to skip that position and proceed to the **DRIVE** setting.

Step 8: Once the color for all gear positions has been programmed, the display will show *1st*, and the PARK position on the Indicator should be on.

Step 9: Tapping the SET switch (less than one second) will now cycle through eight intensity (brightness) settings on the Indicator. Watch the PARK position on the Indicator, and **when the desired intensity (brightness) is found, press and hold the SET switch until the display turns off (approximately three seconds)**. The intensity for the Indicator is now set.

Step 10: Release the SET switch. The decoder box has now exited the Color and Intensity setup mode.

Optional Features and Wiring

NOTE: You must complete the "Programming the Gear Positions" section before connecting the wiring for any of the "OPTIONAL" sections below.

OPTIONAL: Connecting the Neutral Safety Relay

If your vehicle already has a neutral safety switch in the wiring harness to prevent the vehicle from starting while it is in gear, then you do not need to use the neutral safety switch feature in the decoder box, and you will not need to connect this relay.

If your vehicle does not already have a neutral safety switch, cut the wire that runs from your starter switch to the starter solenoid. Connect the wire from the ignition switch to the GREEN wire from the relay and connect the BLACK wire from the relay to the wire going to the starter solenoid. For wiring harnesses which provide wires for the neutral safety relay, connect one side to the GREEN wire and the other side to the BLACK wire.

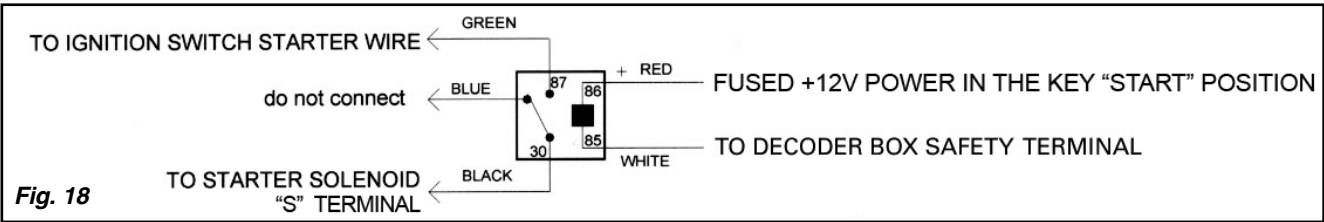
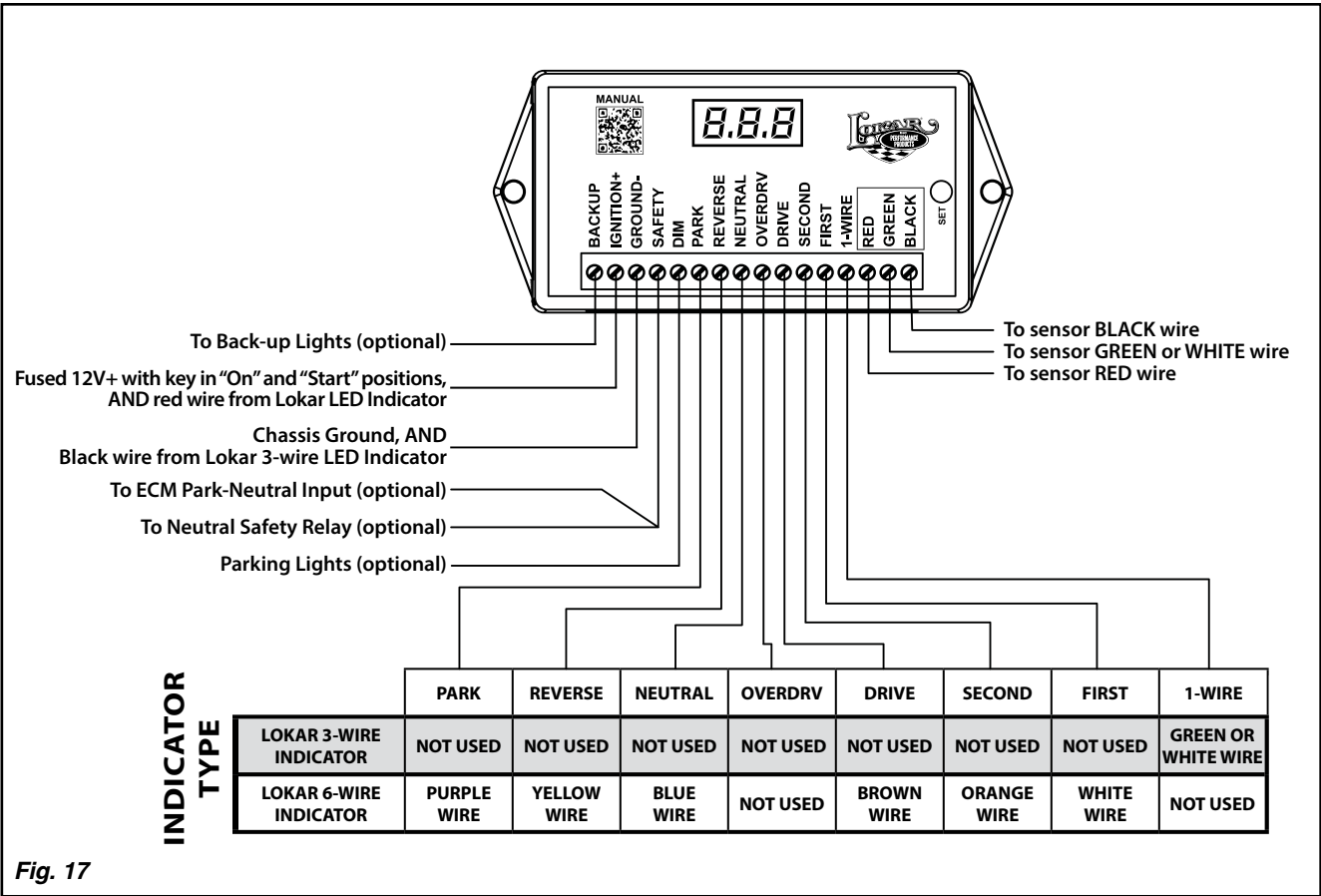
The WHITE wire from the relay connects to the "SAFETY" terminal on the decoder box. The RED wire connects to the power wire for the decoder box. For the neutral safety switch to operate properly, the "IGNITION+" terminal on the decoder box must have power when the key is in the "START" position. **Fig. 18**

OPTIONAL: Connecting The Park/Neutral Signal to an ECM

If your vehicle is fuel injected and the ECM requires a signal when the transmission is in either Park or Neutral, the neutral safety terminal on the decoder box can be used. The "SAFETY" terminal provides a ground when the transmission is in Park or Neutral. This can be connected to the ECM to pass vehicle inspection. The "SAFETY" terminal can be used for both a neutral safety and an ECM signal at the same time.

OPTIONAL: Connecting Backup Lights to the Decoder Box

If your vehicle already has a backup light switch, then you do not need to connect anything to the "BACKUP" terminal. If you do not have a backup light switch and will be using backup lights on your vehicle, then connect the hot side of the backup lights to the terminal marked "BACKUP". This circuit is designed to supply up to 15 amps.



OPTIONAL: Enabling the Indicator's "DIM" Function

If you want the Indicator's LEDs to dim at night, locate a wire or terminal that only has power when your parking lights or headlights are on. Connect a wire from that wire or terminal to the "DIM" terminal on the decoder box.