

sonnax[®] **PERFORMANCE**

faster

tougher

stronger



4L60/E

PERFORMANCE & HEAVY-DUTY
TRANSMISSION • CONVERTER • DRIVESHAFT

VOL. 5

sonnax[®] PERFORMANCE

faster

tougher

stronger

With Sonnax at Your Side,
Any Shop Can Build a
Rock-Solid Transmission

4L60/E

GET STARTED WITH BUILD CHARTS ON PAGE 10

If you think that 4L60/E on your bench can't be faster, tougher, stronger, think again. The world has changed and transmission upgrades from back in the day are old news. Using Sonnax components, performance specialists are bringing this veteran tranny roaring back to life with jaw-dropping performance and reliability unimaginable even a decade ago.

4L60

4L60-E

4L65-E

4L70-E

4L75-E

1982

1993

2001

2006

2016

4L75-E

LEVEL UPGRADES

In 2016, Chevrolet Performance introduced a new member of the 4L60/E family with greatly enhanced torque capacity: the 4L75-E. This transmission was never installed in a production vehicle.

It is available exclusively over the counter from GM dealers and their distributors.

Sonnax components are the foundation of the 4L75-E. When installed in a 4L65-E or 4L70-E, these and other upgrades found in this catalog allow any shop to offer customers a top-tier transmission that meets or EXCEEDS the capabilities of the 4L75-E.

See page 10 for details.

WHERE TO BUY

Ready to order? Find out where to purchase genuine Sonnax products from an online listing of authorized distributors in the U.S. and beyond.

GET YOUR GEARHEAD ON • WWW.SONNAX.COM

CONTACT SONNAX

8:30 a.m. to 5 p.m. ET

(800) 843-2600 TOLL-FREE

+1 (802) 463-9722 INTERNATIONAL

info@sonnax.com



"The best working performance units we have done, and that's not from me, but my customers."

B. Bastedo • Advanced Transmission Care

Fits 4L60-E ('94-Later), 4L65-E, 4L70-E

Part No. HP-4L60E-01



Pump Parts

- Pressure Regulator Spring
- Boost Valve, .490"
- Pump Slide Spring

4L60-E Performance Pack

The Best Sonnax Parts for Performance & Heavy-Duty Recalibration

- **Firmer shifts under load without sacrificing low-speed drivability**
- **Durable parts target commonly worn areas in the transmission & prevent future damage**
- **The only way to eliminate PWM function without over-pressurizing converters (optional)**

The Sonnax Performance Pack is a must-have for any heavy-duty vehicle and the very best foundation for high-performance racing. All components work together to carefully tune line pressure, accumulator pressure and shift calibration. It's the **ULTIMATE** way to get an impressive transmission that responds to throttle and increased load with quick, firm shifts.



Valve Body Parts

- Forward Pinless Accumulator Piston Kit
- Accumulator Valve Shim
- Torlon® Checkballs
- Separator Plate Drills
- TCC Spring & Valve
(optional for eliminating PWM function)



Servo Parts

- 4th Servo Return Spring
- Servo Cushion Spring
- Servo Piston D-Ring Kit



Case Parts

- 3-4 Accumulator Piston Kit
- 3-4 Accumulator Spring
- Servo Release Check Valve



Accumulator Parts

- 1-2 Pinless Piston Kit
- 1-2 Piston Springs
- 1-2 Waved Spring

*"It doesn't give harsh shifts, just a little something extra.
Very nice product and I highly recommend it."*

D. Tucker • Tucker's Transmission



Line Pressure Booster Kits

Crisp, Clean Shifts
without Low-Speed Harshness

- Simple, effective parts install with no special tools required
- Ideal for heavy-duty & modified performance vehicles as well as hard-working daily drivers
- Improved shift feel & durability for fewer comebacks & customer complaints

These booster kits are uniquely designed for precision pressure control. At low-end pressures, they deliver normal engagements, normal light throttle shifts and smooth coastdown shifts. When vehicles are pushed harder, components progressively increase pressure for improved clutch holding capacity and increased durability.

Fits 4L60-E, 4L65-E, 4L70-E

1.907" Sleeve Kit for Early-Style Pumps

Part No. 4L60E-LB1

1.810" Sleeve Kit for Late-Style Pumps

Part No. 4L60E-LB2

- Anodized Aluminum Boost Valve Assembly
- Pressure Regulator Spring
- O-Rings (2)

Fits 4L60 (700-R4), 200-4R

Part No. 700R4-LB1

- Steel Boost Valve Assembly
- Pressure Regulator Spring
- O-Rings (2)



Heavy Duty 2-3 Shift Valve

Improve Input Sprag & Forward Clutch Durability

- Critical upgrade for all heavy-duty & performance vehicles
- Easy to install

The OE 2-3 shift valve only applies the overrun clutch in D3 3rd Gear. For greatly improved durability, the redesigned Sonnax valve applies the clutch in D3 1st, 2nd and 3rd Gears.

Fits 4L60-E, 4L65-E, 4L70-E

Found in Stock 4L75-E

Part No. 77754-41

Clutch Application Comparison

| Range | Gear | OE Valve | Sonnax Valve |
|-------|-----------------|----------|--------------|
| OD | 1 st | OFF | OFF |
| | 2 nd | OFF | OFF |
| | 3 rd | OFF | OFF |
| | 4 th | OFF | OFF |
| D3 | 1 st | OFF | APPLIED |
| | 2 nd | OFF | APPLIED |
| | 3 rd | APPLIED | APPLIED |
| D2 | 1 st | APPLIED | APPLIED |
| | 2 nd | APPLIED | APPLIED |
| D1 | 1 st | APPLIED | APPLIED |
| | 2 nd | APPLIED | APPLIED |

SmartShell® Heavy Duty Reaction Shell Kit

Solves Multiple Problems in All Performance Applications

- Stops spline stripping
- Prevents hub breakage
- Eliminates planetary bearing failure

Bulky aftermarket shells always fall short when splines continue to strip and the shells break under stress. A chronic problem with both OE and thicker aftermarket shells is failure of the rear planetary bearing. From your daily jobs to extreme builds, the patented SmartShell is the only way to prevent shell failure AND protect the bearing.

Learn More About Shell Failure

www.sonnax.com/smartshell

This Sonnax video takes you inside the sun gear shell to see the source of common failures and learn how only the SmartShell can stop them all.



Balance Durability with Drivability When Upgrading the 2nd Gear Servo

There are plenty of 2nd Gear servo sizes available for the 4L60/E, but going for the biggest isn't always best. Some large-ratio servos are not ideal for daily drivers because they change shift feel TOO much. For most applications, you have two upgrade options: the "Corvette" ratio or the Sonnax super hold.

Choose the Sonnax "Corvette" ratio servo to:
Upgrade from a smaller-ratio stock servo and add holding power in many street applications.

4-cyl./V-6
(Smallest OE
Apply Area)
.46 Ratio

V-6/V-8
.55 Ratio

4L70-E
.63 Ratio

Corvette
(Largest OE
Apply Area)
.74 Ratio

Sonnax
Super Hold
.87 Ratio



Learn more about OE and aftermarket 2nd Gear servo options by reading "A New Trick in the Bag" in the Sonnax online tech library.

Choose the Sonnax super hold servo to:
Upgrade from a stock "Corvette" servo or add max holding power in extreme applications.

2nd Gear "Corvette" Ratio Servo Kit

Improved Holding Power for a
Wide Range of Street Applications

- .74 Ratio servo delivers firmer 1-2 & 2-3 shifts than smaller servos
- Exclusive Sonnax servo features Viton® D-rings for more consistent apply & release than stock servos



Fits 4L60, 4L60-E, 4L65-E, 4L70-E

Part No. 77701-04K

Extra Wide Intermediate Bands

15% More Holding Capacity for High-Torque Applications

Fits 4L60, 4L60-E, 4L65-E, 4L70-E
Kevlar Band Found in Stock 4L75-E

- Ideal for 4x4, heavy-duty & commercial use
- 60% Thicker case anchor design reduces band failure
- Drop-in replacements, no drum modifications required

Red Band Part No. 77700-01

Firmer shifts than OE, high-energy bands.

Kevlar® Band Part No. 77700-01K

Performs like later-model, OE bands with high-energy material. While the shifts may not be as firm as with a red-lined band, overall durability is often better, including in extreme applications.



SUPER HOLD SERVOS

MAXIMUM APPLY AREA • IN-VEHICLE INSTALL • DURABLE BILLET ALUMINUM

COMBINE
FOR

UNMATCHED HOLDING POWER & SHIFT PERFORMANCE



2nd Gear Super Hold Servo Kit

18% More Apply Area than "Corvette" Servo

- Maximizes holding power in 2nd Gear with more positive 1-2 & 2-3 shifts
- .87 Ratio servo avoids the timing flaws & excessive shock loads found in other aftermarket servos
- Dual seals ensure positive band apply/release & eliminate cross leaks
- Apply pin seals reduce leakage of 3rd Gear pressure



Fits 4L60, 4L60-E, 4L65-E, 4L70-E
Found in Stock 4L75-E

Part No. 77911-03K

- Piston w/ D-Rings
- Separator w/ D-Rings & O-Rings
- Apply Pin w/ PTFE & O-Ring Seals

4th Gear Super Hold Dual Servo Kit

40% More Apply Area

- Patented dual-piston design delivers greater holding power than stock servo
- D-ring seals prevent pressure loss
- Use with OE, "Corvette" or Sonnax 2nd Gear servo assemblies



Fits 4L60, 4L60-E, 4L65-E, 4L70-E
Found in Stock 4L75-E

Part No. 77767K

- Servo Assembly
- Steel Washer

Heavy Duty 3-4 Backing Plate Kit

Affordable, Drop-In Upgrade
Guards Against 3-4 Comebacks

- Thicker backing plate is stiffer than any other option on the market to stop heat build-up from clutch pack flex
- Ideal for daily drivers & mild street/strip applications
- Upgrades OE 4L60 (700-R4) & 4L60-E to seven frictions

If your customers are experiencing 3-4 clutch failure, you need to change the parts you're installing. Sonnax upgrades ELIMINATE this area as the weak link in 4L60/E transmissions, and the heavy duty backing plate kit is an easy, effective way to help prevent burn up in all but the most extreme builds.

The kit works by targeting the root cause of failure: a weak OE backing plate that flexes during apply, allowing heat to build up within the clutch pack. Old-school aftermarket kits that add friction plates, but do so with thinner apply and backing plates, only make the flex worse and do not notably improve 3-4 clutch durability.



Fits 4L60, 4L60-E, 4L65-E, 4L70-E

Part No. 74140-01K

- Backing Plate
- Apply Plate

Requires '91-later 3-4 apply ring stamped with number "7", measuring 3.671" to 3.682" in height.

For higher-power applications where max durability AND expanded clutch capacity are required to prevent 3-4 failure, install a Smart-Tech® input housing kit.

Input Drum Reinforcement Kit

Prevents Cracking & Spline Stripping



- Chromoly steel sleeve
- Custom overrun piston works with steel forward piston
- Also available on new, OE housing with installed heavy duty input shaft (see page 15)

This kit requires use of a '97-later stamped steel forward piston and dual-cage return spring. See part instructions at www.sonnax.com for details.

Fits 4L60, 4L60-E, 4L65-E, 4L70-E

Part No. 77733-51K

- Reinforcement Sleeve
- Overrun Piston
- Piston Outer & Inner Seals

Heavy Duty Overrun Clutch Hub

Stop Hub Failure During Deceleration
Engine Braking in D3, D2 & D1

**Fits 4L60, 4L60-E,
4L65-E, 4L70-E**

Part No. 74574-HD

- 2X Thicker than OE clutch hubs to prevent cracking & breaking in critical areas that engage the input sprag inner race
- Manufactured from high-strength 4140 chromoly steel
- Direct replacement for '95-later hubs



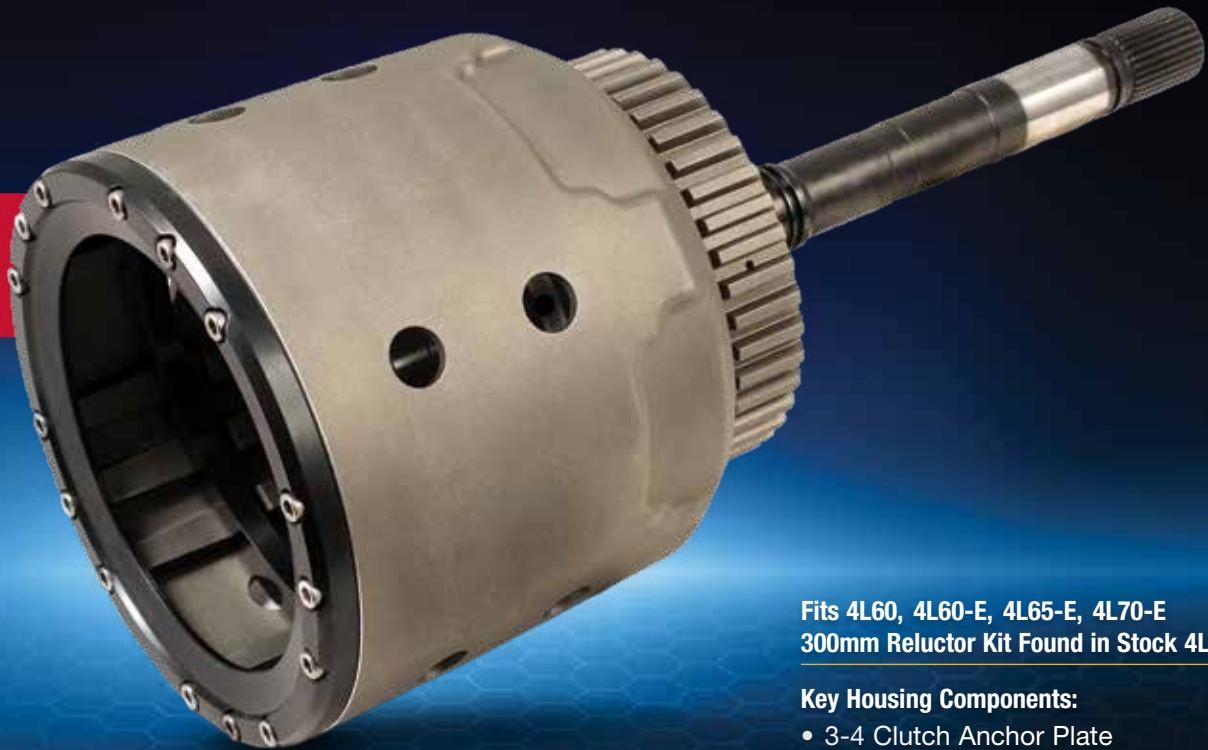
Smart-Tech® Input Housing Kit

Upgraded Housing Eliminates 3-4 Clutch Failure

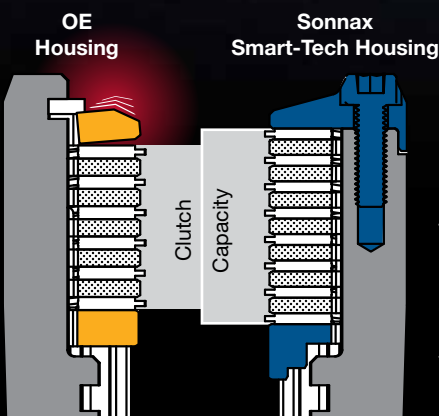
- Increases 3-4 clutch capacity
- Stops 3-4 backing plate flexing & distortion
- Protects against fatigue failure
- Prevents housing breakage
- Ends 3-4 retaining ring blow-out

"The Smart-Tech input housing kit is the best in the business. Have it in my 4L65-E putting down over 700rwhp. Zero issues, no slippage and low temps."

N. Rodriguez • Koncept Motorwurks



Limitations of the OE input housing are the root cause of 3-4 burn up in performance applications. The patented Sonnax Smart-Tech housing design makes room for a taller clutch pack anchored in place by a stronger backing plate. Get the most out of your favorite clutches — the Smart-Tech housing is the only way to increase clutch capacity AND protect against destructive heat.



SMOKE THE TIRES, NOT THE CLUTCHES!

Track-proven to 1,000 HP, the Smart-Tech housing stops backing plate flex AND expands clutch capacity for max protection against burn up. Learn more about upgrading the 3-4 clutch on page 12.

**Fits 4L60, 4L60-E, 4L65-E, 4L70-E
300mm Reluctor Kit Found in Stock 4L75-E**

Key Housing Components:

- 3-4 Clutch Anchor Plate
- Input Housing
- Input Housing Reinforcement Sleeve
- Rear Stator Support Bushing
- Overrun Piston
- 3-4 Clutch Apply Plate
- 3-4 Clutch Return Springs
- Socket Head Cap Screws
- Seals (5)

Housing Kit Only

Part No. 77733-06K

Housing Kits with Heavy Duty Input Shafts

300mm Non-Reluctor

Part No. 77733-11K

300mm Reluctor

Part No. 77733-12K

298mm

Part No. 77733-10K

These kits require use of a '91-later 3-4 apply ring, '97-later ring gear, '97-later stamped steel forward piston and dual-cage return spring. 298mm shaft may require converter/stator modifications. See part instructions at www.sonnax.com for details.

See the OE Flex - Watch the Demo Video

www.sonnax.com/smart-tech-input-housing

"The Sonnax six-pinion 2.84 planet is exactly what 60E transmissions need to further evolve their spot in the performance world."

B. Alley • Revolution Race Works

2.84 Input Carrier Kit

Ramp Up from OE Wide Ratio to Race-Ready Close Ratio

- Keeps engine in power band on 1-2 & 2-3 shifts
- Delivers longer pull in 1st & 2nd Gears
- Reduces stress on internal parts
- Six-pinion planet loaded with advanced durability features

The shift from 3.06 ratio (1st Gear) to 1.63 ratio (2nd Gear) is a dramatic RPM drop that causes performance engines to fall out of their power band. Sonnax's 2.84 input carrier transforms the popular 4L60 series from an OE "wide ratio" 3.06/1.63 to a "close ratio" 2.84/1.55 for game-changing acceleration on the track.



Fits 4L60, 4L60-E, 4L65-E, 4L70-E

Part No. 77284-K

Fits '06-earlier reaction shafts only and requires use of OE bearing 8642191 or 24217327 (not included in kit). See part instructions at www.sonnax.com for details.

Heavy Duty Reaction Shaft Kit

Supreme Strength for Extreme Builds

- High-strength, chromoly steel alloy outperforms all other OE & aftermarket shaft materials
- Prevents spline twist & wear in high-torque applications
- Universal fit for all years & all input carrier styles

OE and aftermarket reaction shafts made from plain carbon steel often exhibit spline twist and fretting/wear in high-torque applications, especially when used in heavy vehicles. To eliminate these problems, the Sonnax shaft is made from a high-strength, chromoly alloy that guarantees the ultimate in performance and durability. Its unique design — plus the bearings and shim included in the kit — allow easy assembly with any style input carrier, including the Sonnax 2.84 ratio, six-pinion carrier.



Fits 4L60, 4L60-E, 4L65-E, 4L70-E

Part No. 74602-01K

- Reaction Shaft with Bushings
- Bearings (2)
- Shim



Bearing & Shim Allow Shaft to Fit All Carrier Styles

HEAVY-DUTY SHAFTS

#1 CHOICE FOR HIGH-HORSEPOWER STREET/STRIP BUILDS

Input Shafts

- High-strength steel shafts with unbroken performance in thousands of runs
- Shot peened & cryogenically treated for extreme durability
- Unique design protects against failure from stress cracks

Fits 4L60-E, 4L65-E, 4L70-E (300mm)
77733-12S Found in Stock 4L75-E

For Non-Reluctor Units Part No. 77733-11S
For Reluctor Units Part No. 77733-12S

Fits 4L60, 4L60-E (298mm)

Part No. 77733-10S

Fits '85-later 298mm units with 30-spline input shaft. For '82-'84 units with 27-spline input shaft, converter and stator shaft will need to be updated to '85-later design.

Input shafts also available pre-installed in a Smart-Tech input housing. See page 7.



Output Shafts

- High-strength 300M steel shafts with rolled splines
- Specially heat-treated & processed for maximum toughness
- Torsional design absorbs energy, reducing peak loads to critical areas

Fits 4L60-E, 4L65-E, 4L70-E

For 2WD & Corvette Units Part No. 74678L-HD
For 4WD/AWD Units Part No. 74678S-HD



Rear Stator Support Bushing

Fits 4L60, 4L60-E, 4L65-E, 4L70-E Part No. 77002BT-01

Unrivaled Support for the 20 lb. Input Housing PLUS Long-Term Reliability

Stop struggling with failure-prone bushings and fitment issues! Sonnax offers a wider, drop-in bushing that's both better-fitting — with a closely toleranced I.D. usually reserved for machined-in-place bushings — AND lined with PTFE to stop future wear in its tracks.

HIGHLY
WEAR-RESISTANT
PTFE LINING



BUILD THE **KILLER** 4L60/E WITH SONNAX

The 700-R4/4L60/E family of transmissions is the most popular performance platform in the world, thanks in large part to Sonnax components that allow them to run reliably at extreme power levels. The following key areas **MUST** be addressed to realize the full potential of these units:

Improve Transmission Torque Capacity

Whether we're speaking in terms of torque capacity or horsepower, what we're really talking about is modifying the transmission to withstand the stress it's being put under. Sonnax upgrades allow drivers to take full advantage of any vehicle's torque/HP, far beyond what stock transmissions can handle.

In 2016, Chevrolet Performance introduced a new member of the 4L60/E family with greatly enhanced torque capacity: the 650 ft-lb 4L75-E. Its jump in torque rating over the 495 ft-lb 4L70-E is largely thanks to Sonnax upgrades, the same ones featured in this catalog:

4L75-E

LEVEL UPGRADES

2nd & 4th Gear Super Hold Servos



Heavy Duty 2-3 Shift Valve

Smart-Tech® Input Housing
& Heavy Duty Input Shaft



Kevlar® Extra Wide
Intermediate Band

When these Sonnax parts are installed in a 4L65-E or 4L70-E, you've landed at the torque capacity of a 4L75-E.

With a few more Sonnax upgrades to enhance performance and durability — a Sonnax Level 3 build — now you've got a big power tranny that not only **EXCEEDS** 4L75-E capabilities, but is moving well into 4L80-E territory. For those on the fence about swapping transmissions, it's a great way to avoid the complications and inefficiencies of converting to a 4L80-E.

Continued on Page 12

Don't risk throwing products from different manufacturers into the same tranny when there's no guarantee they're all going to play nice. Installing Sonnax parts designed to work together is the **BEST** and **SAFEST** way to upgrade a transmission.

Key upgrades for different build levels are below. Find more components for top-quality repairs and upgrades on pages 14 and 15.

HD PICKUP BUILDS

OPTION A

Line Pressure Booster Kit

See Page 2

SmartShell® Heavy Duty
Reaction Shell Kit **77749-02K**

Rear Stator Support Bushing
77002BT-01

4th Gear Super Hold Dual Servo Kit
77767K

Heavy Duty 2-3 Shift Valve
77754-41

OPTION B

Performance Pack
HP-4L60E-01

SmartShell® Heavy Duty
Reaction Shell Kit **77749-02K**

Heavy Duty 3-4 Clutch
Backing Plate Kit **74140-01K**

Rear Stator Support Bushing
77002BT-01

4th Gear Super Hold Dual Servo Kit
77767K

Heavy Duty 2-3 Shift Valve
77754-41

OPTION A Quick upgrades for big performance without a big price tag.

OPTION B Best parts for heavy-duty recalibration and durability.

STILL GOING STRONG AGAINST 900HP • 1,000 FT-LB • AWD

One of the world's most extreme 4L60/E vehicles, a Sonnax Level 3 build harnessed the "Hated" Sycrone's huge horsepower and massive torque at track events and road races nationwide.



PERFORMANCE BUILDS

LEVEL 1

For lightly modified performance/enthusiast vehicles.

| OPTION A | |
|--|-------------|
| Line Pressure Booster Kit | See Page 2 |
| 4 th Gear Super Hold Dual Servo Kit | 77767K |
| 2 nd Gear Super Hold Servo Kit | 77911-03K |
| 2 nd Gear "Corvette" Ratio Kit | 77701-04K |
| Choose 2 nd Gear Servo | |
| OPTION B | |
| Performance Pack | HP-4L60E-01 |
| SmartShell® HD Reaction Shell Kit | 77749-02K |
| Heavy Duty 3-4 Clutch Backing Plate Kit | 74140-01K |
| Rear Stator Support Bushing | 77002BT-01 |

OPTION A Upgrades for performance recalibration and durability, no trans removal required. Most change in shift feel comes from the servos.

OPTION B Best parts for performance recalibration and durability. Most change in shift feel comes from the Performance Pack.

LEVEL 2

For moderately modified performance vehicles (up to 450HP).

| | |
|---|-------------|
| Performance Pack | HP-4L60E-01 |
| SmartShell® Heavy Duty Reaction Shell Kit | 77749-02K |
| Rear Stator Support Bushing | 77002BT-01 |
| Heavy Duty 2-3 Shift Valve | 77754-41 |
| 4 th Gear Super Hold Dual Servo Kit | 77767K |
| 2 nd Gear "Corvette" Ratio Servo Kit | 77701-04K |
| Kevlar® Extra Wide Intermediate Band | 77700-01K |
| Input Drum Reinforcement Kit | 77733-51K |
| Heavy Duty 3-4 Clutch Backing Plate Kit | 74140-01K |

LEVEL 3

For all extreme performance applications (above 450HP).

| | |
|--|-------------|
| Performance Pack | HP-4L60E-01 |
| SmartShell® Heavy Duty Reaction Shell Kit | 77749-02K |
| Heavy Duty 2-3 Shift Valve | 77754-41 |
| 4 th Gear Super Hold Dual Servo Kit | 77767K |
| 2 nd Gear Super Hold Servo Kit | 77911-03K |
| Kevlar® Extra Wide Intermediate Band | 77700-01K |
| Smart-Tech® Input Housing & Heavy Duty Input Shaft Kit | See Page 7 |
| 4WD/AWD Heavy Duty Output Shaft | 74678S-HD |
| 2WD & Corvette Heavy Duty Output Shaft | 74678L-HD |
| Heavy Duty Reaction Shaft Kit | 74602-01K |
| 2.84 Input Carrier Kit | 77284-K |

Choose Output Shaft



Continued from Page 10

Hunt Down Unstable Pressure, the Real Pump Killer

When running at higher average pressures, the whole hydraulic system **MUST** be in top condition to minimize the risk to the pump vane rings. Pressure pulsation from poor PR valve control is the real danger, and a sure sign of this problem is gauge needle-bounce when testing line pressure.

Stabilizing pressure starts with precise valve-to-bore clearances (PR valve bore wear is common in 4L60/E units) and a quality, leak-free boost valve. It's also essential to feed the boost valve with a properly working (clean) EPC solenoid and steady AFL pressure to the EPC solenoid.

Installing Sonnax oversized PR valve (77917-06 or 77917-07), boost valve with O-rings (multiple options) and AFL valve kit (77754-09K) is highly recommended for resolving pump pressure problems.

Take Care of the Servo Band

Switching to a wider band (Sonnax 77700-01 or 77000-01K) is an ideal capacity/durability upgrade, but **NEVER** install a wider band on a used drum. The old band will have compressed the drum and created a subtle dish on its surface. When used with a wider band, this dish leads to slipping in 2nd Gear, glazing and burning, and will eventually throw off the band adjustment.

Always check band/pin adjustment to prevent band release problems. Sonnax servo kits include instructions for setting servo travel between .075" and .125" using a dial indicator. Never shim the servo, as this moves the piston deeper into the bore where it's more prone to bottoming out and causing band failure.

Don't Get Burned When Expanding 3-4 Clutch Capacity

Guarding against 3-4 clutch failure has traditionally meant working within the limited space of the OE input housing. Squeezing in more frictions requires installing a thinner backing plate with thinner clutches and steels, **BUT**:

- Adding friction surfaces reduces the amount of steel
- Steel in the clutch pack helps dissipate heat
- Without enough steel, heat builds up and clutches burn

Adding more, thinner plates increases static holding capacity by sacrificing engaging capacity. Durability suffers in higher-load applications where more energy goes into the clutch during the shift.

The **ONLY** way to expand clutch capacity without sacrificing steel mass is by replacing the OE input housing with the Sonnax Smart-Tech® housing (see page 7). Its custom design holds a physically larger clutch pack to eliminate 3-4 clutch burn up while also guarding against other common problems.

Stop 3rd Accumulator Checkball Leakage

It's crucial to prevent even minor leaks in the 3rd accumulator checkball capsule, as these are directly related to band and 3-4 clutch failure. Vacuum testing the capsule (located in the servo area of the case) with Sonnax vacuum test stand kit VACTEST-01K is a quick and reliable way to check for leaks.

Reduce Harsh 1-2 Shift Damage

Damage to the band, input/output shafts, sprag, etc. can be reduced by properly cushioning the large ratio change on the 1-2 shift:

- Never use a 1-2 servo that eliminates the cushion spring
- Never reduce the 1-2 accumulator piston stroke
- Never leave out the 1-2 checkball
- Never over-drill the 1-2 feed hole

Reduce ratio change by converting 1st Gear from 3.06 to 2.84 with Sonnax input carrier kit 77284-K (see page 8).

Pursue Input Sprag Perfection

You don't move when the input sprag fails, a critical link often overlooked during transmission upgrades.

- Install a new sprag assembly that includes new inner/outer races. Used races may be worn or manufactured out of spec.
- Easily strengthen and reinforce the sprag by installing Sonnax heavy duty 2-3 shift valve 77754-41 (see page 2).
- Clean fluid is essential for maximum sprag durability. Make sure the transmission pan has a drain plug, and change the fluid often to prevent micron-sized debris from undermining sprag engagement.

Help the Rear Ring Survive by Moving Up to Five Pinions

Increasing the number of planet pinions from four to five distributes load more evenly on the sun gear and around the ring gear. At high torque, this reduces stress/flexing of the ring gear and improves durability.

Control Valve Body Bleeding

The foundation of a good unit is a tight, leak-free valve body that prevents pressure loss and conserves pump volume. Since bore wear is common in the 4L60-E series, ALL circuits should be vacuum tested to identify leaks. Use Sonnax vacuum test stand kit VACTEST-01K along with valve body vacuum test plate 77754-VTP, or test without plate using free vacuum test guides found at www.sonnax.com/vactest.



Remanufactured Valve Bodies

The core of a powerhouse transmission is a valve body free of wear and tear. Save time and money with a quality rebuilt valve body from Sonnax, the BEST foundation for performance and heavy-duty upgrades.

- **Completely refurbished with genuine Sonnax parts**
- **Hydraulically & electronically tested, ready to bolt up**
- **Limited Lifetime Warranty**

Stabilize Transmission Pressure with a Better Oil Pan

The best deep pan to use is an aftermarket model with a filter extension to place the filter lower into the oil sump. It helps prevent air ingestion during hard acceleration, which can destabilize transmission pressure and lead to slipping.

Optimize Computer Programming & Tuning with Care

No matter how well-built the unit, poor computer programming will quickly kill the transmission. It's vital to be informed about the many modification options available and how they affect performance and durability. Here are a few examples of classic programming pitfalls:

Pressure Control Optimization

Setting incorrect parameters allows line pressure to drop "off the mapping table" to a minimum range when maximum pressure is required. It's a well-intended tuning mistake that can lead to clutch-roasting pressure drops.

"Torque Management" Mods

This feature often is completely disabled, even though leaving a little "on" will help maximize driveline durability without slowing the vehicle. Figuring out the best balance requires tuning experience and a solid understanding of a particular vehicle's setup.

Continuous Slip (EC3) TCC Control

Since higher-stall aftermarket converters aren't designed for continuous slip, it might seem reasonable to eliminate this function. Simple on-off operation can be excessively harsh, though, especially when the converter is damperless.

A better programming option is disabling the EC3 continuous slip, while keeping the pulse-width modulated (PWM) TCC apply so that the converter clutch comes on in a ramped, controlled manner.

| Application | Part No. |
|-------------------------------|----------|
| 4L60-E, 4L65-E, 4L70-E | |
| '03-'08 | GM051 |
| '01-'02 Annular Lockup | GM049 |
| '96-'01 | GM048 |
| '95 | GM047 |
| '93-'94 | GM046 |
| 4L60 | |
| Electronic TCC | GM044 |
| Hydraulic TCC | GM043 |

MORE Sonnax Components for Top-Quality Builds

On the street and on the track, Sonnax parts are trusted by top shops to work harder, last longer and deliver the absolute best in transmission performance. For the 4L60/E series alone, more than 200 top-of-the-line components are available for repairs and upgrades.

Components listed in RED below should always be considered for racing or heavy-duty builds.

| 4L60 | 4L60-E | 4L65-E | 4L70-E | Part Name | Description | Tool Required | Part No. |
|----------------------------------|--------|--------|--------|---|---|---------------|------------|
| Valve Body | | | | | | | |
| 60 | 60E | 65E | 70E | Pinless Accumulator Piston Kit | Piston, seals & balls for 1-2 or 3-4 locations | | 77998-03K |
| | 60E | 65E | 70E | Pinless Forward Accumulator Piston Kit | Aluminum, dual seal | | 77987-01K |
| 60 | | | | Oversized Accumulator Pin & Reamer Kit | Large pin starter kit, includes 10 pins | | 77999-02K |
| | 60E | 65E | 70E | Oversized Accumulator Pin & Reamer Kit | Small pin starter kit, includes 10 pins | | 77754-02K |
| 60 | 60E | 65E | 70E | 1-2 or 3-4 Accumulator Spring | Purple, 5/bag | | 74926 |
| 60 | 60E | 65E | 70E | 1-2 or 3-4 Accumulator Spring | High-strength material, 5/bag | | 77704S |
| 60 | 60E | | | Accumulator Valve Train Kit | Medium-weight vehicles | | 77777L-K |
| 60 | 60E | | | Accumulator Valve Train Kit | Heavy-weight vehicles | | 77777M-K |
| 60 | 60E | 65E | 70E | Checkball | Imidized plastic, .250" dia., 10/bag | | 10000-08 |
| | 60E | 65E | 70E | TCC Regulator & Isolator Valve Kit | Fits all years & EC3 units | Yes | 77754-04K |
| | 60E | 65E | 70E | TCC Regulator & Isolator Valve Kit | 10% Higher apply pressure | Yes | 77754-03K |
| | 60E | 65E | 70E | Isolator Sleeve Kit | For worn isolator bore in unserviced VB or for any factory remanufactured VB | Yes | 77754-IS0 |
| | 60E | 65E | 70E | Actuator Feed Limit (AFL) Valve Kit | Feeds solenoids | Yes | 77754-09K |
| | 60E | 65E | 70E | Forward & Reverse Abuse Bore Plug | Fits two locations | | 77754-21 |
| | 60E | 65E | 70E | Forward & Reverse Abuse Valve Kit | Improved design, fits either of two locations | | 77754-35K |
| | 60E | 65E | 70E | Oversized Forward & Reverse Abuse Valve Kit | Fits either of two locations | Yes* | 77754-58K |
| | 60E | 65E | 70E | 3-2 Control Valve Spring | | | 77754-23 |
| | 60E | 65E | 70E | Oversized 4-3 Sequence Valve Kit | | Yes | 77964-04K |
| | 60E | 65E | 70E | 3-4 Relay O-Ringed End Plug Kit | | | 77964-08K |
| | 60E | 65E | 70E | Oversized 3-4 Shift Valve Kit | Includes matched spring | Yes* | 77754-42K |
| | 60E | 65E | 70E | EPC Solenoid Harness Adapter | Allows plug-and-play installation of early-style solenoids into '03-later units | | 34435-01K |
| 60 | | | | TV Plunger Spring | 5/Bag | | 77968-01K |
| 60 | | | | Throttle Valve Plunger Valve Kit | OEM #94 | | 77966-94K |
| 60 | | | | Throttle Valve Plunger Valve Kit | Delays 4-3 downshift | | 77966-94MK |
| Case | | | | | | | |
| 60 | 60E | 65E | 70E | Servo Release Check Valve Kit | Tunes 2-3 shift | | 77701-076 |
| 60 | 60E | 65E | 70E | 3-4 Accumulator Sleeve Kit | | | 77998-01K |
| 60 | 60E | 65E | 70E | 3rd Accumulator Checkball & Seat | | | 74480D |
| 60 | | | | Governor | Mostly diesel, OE 8642729 | | 729 |
| 60 | | | | Governor | Gas, OE 8642730 & 8647041 | | 730 |
| 60 | | | | Governor | Gas, 250, 305 & 350 engines, OE 8642731 | | 731 |
| 60 | | | | Governor | Gas, Corvette, Camaro/Firebird, Caprice, OE 24202117 & 8663388 | | 117 |
| Linkage or Park Mechanism | | | | | | | |
| 60 | | | | Carburetor TV Linkage Corrector Kit | Holley® style linkage | | AS4-04K |
| 60 | | | | Carburetor TV Linkage Corrector Kit | Edelbrock® style linkage | | AS4-05K |
| 60 | | | | TV Cable Corrector Kit | Spring & stop, 5 each/bag | | AS1-01K |
| | 60E | | | Shift Cable Mount Bracket | | | 34913-01 |

*Installation tooling requires the Sonnax VB-FIX reaming fixture.

| 4L60 | 4L60-E | 4L65-E | 4L70-E | Part Name | Description | Tool Required | Part No. |
|------------------------------|--------|--------|--------|--|---|---------------|------------|
| Servo | | | | | | | |
| 60 | 60E | 65E | 70E | Servo Pin Kit | Extra long pin, includes seals | | 77787-02K |
| Pump | | | | | | | |
| 60 | 60E | 65E | 70E | Pump Vane | Koyo® (OE), 100/bag | | 1280 |
| 60 | 60E | 65E | 70E | Pump Slide Pivot Pin | 5/Bag | | 65797 |
| 60 | 60E | 65E | 70E | Pump Slide Spring | High RPM, replaces 2 OE springs, 5/bag | | 77722-01K |
| 60 | 60E | 65E | 70E | Pump Spring Spacer | 10/Bag | | 77917-RV |
| 60 | 60E | 65E | 70E | Pump Bushing | PTFE-coated like OE bushing | | 77005T |
| 60 | 60E | | | TCC Apply Valve Kit | Non-PWM only, steel with PTFE seal | | 77805-K |
| | 60E | 65E | 70E | TCC Apply Valve Kit | PWM only, aluminum with PTFE seal | | 77805E-K |
| 60 | | | | Oversized Pressure Regulator Valve | | Yes | 77917-06 |
| | 60E | 65E | 70E | Oversized Pressure Regulator Valve | | Yes | 77917-07 |
| 60 | | | | TV Boost Valve Kit | .423" Bore dia., O-ring style | | 77917-01K |
| 60 | | | | TV Boost Valve Kit | .471" Bore dia., O-ring style | | 77917-471 |
| 60 | | | | TV Boost Valve Kit | .500" Bore dia., O-ring style | | 77917-500 |
| 60 | | | | Reverse Boost Valve Kit | Large ratio, O-ring style | | K77898 |
| | 60E | 65E | | Boost Valve Kit | .470" Dia., O-ring style, early pump design | | 77898E-4K |
| | 60E | 65E | | Boost Valve Kit | .490" Dia., O-ring style, early pump design | | 77898E-K |
| | 60E | | | Boost Valve Kit | .421" Dia., O-ring style, late pump design | | 77898E-14K |
| | 60E | 65E | 70E | Boost Valve Kit | .472" Dia., O-ring style, late pump design | | 77898E-16K |
| 60 | | | | Elevated Pressure Main PR Spring | Higher pressure | | 77917-08 |
| | 60E | 65E | 70E | High-Performance PR Spring | Higher pressure | | 77917-10 |
| 60 | 60E | | | TCC Solenoid Snout Kit | '96-Earlier | | 77942-01K |
| 60 | 60E | | | Stator Support Shaft Kit | 298mm/245mm Converter units, non-reluctor style | | 77918S-K |
| | 60E | | | Stator Support Shaft Assembly | 298mm Converter units, reluctor style | | 77918S-08K |
| | 60E | 65E | 70E | Stator Support Shaft Assembly | 280mm/300mm Converter units, reluctor style | | 77918S-09K |
| | 60E | 65E | 70E | Stator Support Shaft Assembly | 280mm/300mm Converter units, non-reluctor style | | 77918S-1K |
| Internal Transmission | | | | | | | |
| 60 | 60E | 65E | 70E | Input Drum Reinforcement Kit | Includes sleeve & seal only | † | 77733-02K |
| 60 | 60E | | | Reinforced Input Housing Kit with Heavy Duty Input Shaft | 298mm Converter units | | 77733-13K |
| | 60E | 65E | | Reinforced Input Housing Kit with Heavy Duty Input Shaft | 300mm Converter units, non-reluctor style | | 77733-14K |
| | 60E | 65E | 70E | Reinforced Input Housing Kit with Heavy Duty Input Shaft | 300mm Converter units, reluctor-style | | 77733-15K |
| 60 | 60E | 65E | 70E | Billet Forward Clutch Piston | For use with OE aluminum overrun pistons | | 77764-01 |
| 60 | 60E | 65E | 70E | 3-4 Clutch Boost Spring | '88-Later, 10/bag | | 77763-01 |
| 60 | 60E | 65E | 70E | Wide Reaction Sun Gear Bushing | 1.5X Wider than OE bushing | | 77010-01 |
| | 60E | 65E | 70E | Captured Front Planetary Bearing | .199" Thick black bearing, '99-later | | 77747-01 |
| 60 | 60E | 65E | | Rear Planetary Thrust Bearing | .140" Thick, '06-Earlier | | 77731-09 |
| | 60E | | 70E | Rear Planetary Thrust Bearing | .160" Thick, '07-Later | | 77731-10 |
| 60 | 60E | 65E | 70E | Rear Planetary Pinion Pin | Solid, 5/bag | | 77732-02 |
| 60 | 60E | | | Rear Planetary Rebuild Kit | 4-Pinion planetary | | 77731-RK |
| | | 65E | 70E | Rear Planetary Rebuild Kit | 5-Pinion planetary | | 77732-RK |
| 60 | 60E | | | Oil Deflector | 4-Pinion rear planetary | | 77731-08 |
| 60 | 60E | 65E | 70E | Bearing Kit | '82-Later | | SBK-G12 |
| 60 | 60E | 65E | 70E | Front Endplay Shim | .015" Thick (input housing to bearing), 10/bag | | 77409-15 |
| 60 | 60E | 65E | 70E | Rear Endplay Shim | .010" Thick (rear ring gear to bearing), 10/bag | | 77406-10 |

†Machining Required

CONVERTER

On the road and on the track, Sonnax is the world's #1 full-line supplier of the quality converter components essential for long-lasting, trouble-free performance.

Performance Converter Kits

Engineered to Deliver Builds that Last

- Widest variety of kits available
- Designed for ease of assembly
- Improve acceleration & durability with confidence
- Supreme Sonnax quality in every component

A performance torque converter is highly specialized based on the performance characteristics of the specific vehicle. Unlike many labor-intensive aftermarket kits, Sonnax kits ensure fast, easy assembly with predictable tuning adjustments.

From the weekend enthusiast to the hardcore competitor, Sonnax has you covered!



Additional components may be required when using these kits, see details at www.sonnax.com.

| Transmission Unit | Converter Core | Spline Count | Details | Dampered | Part No. |
|------------------------|----------------|--------------|---|----------|-----------|
| 200-4R, 4L60, 4L60-E | GM 245mm | 27 | Non-Lockup, 298mm | No | GM-RK-9 |
| | GM 245mm | 27 | Single-Plate Lockup, 298mm, Mounting Ring | Yes | GM-RK-12 |
| 4L60-E | GM 245mm | 30 | Single-Plate Lockup, 298mm | Yes | GM-RK-18 |
| | GM 245mm | 30 | Single-Plate Lockup, 300mm, Mounting Ring | Yes | GM-RK-13 |
| | GM 245mm | 30 | Single-Plate Lockup, 300mm | Yes | GM-RK-17 |
| 4L60, 4L60-E | GM 258mm | 30 | Multi-Plate Lockup, 298mm | No | GM-RK-498 |
| | GM 265mm | 30 | Multi-Plate Lockup, 298mm | No | GM-RK-495 |
| | GM 245mm | 30 | Non-Lockup, 298mm | No | GM-RK-10 |
| | GM 245mm | 30 | Single-Plate Lockup, 298mm, Mounting Ring | Yes | GM-RK-11 |
| 4L60-E, 4L65-E, 4L75-E | GM 258mm | 30 | Multi-Plate Lockup, 300mm | No | GM-RK-408 |
| | GM 265mm | 30 | Multi-Plate Lockup, 300mm | No | GM-RK-405 |

WOVEN CARBON CONVERTER KITS Exclusively from Sonnax!

Multi-plates with authentic, OE-quality woven carbon frictions deliver the ultimate in performance and durability, and they're available only from Sonnax. Woven carbon rings also sold separately.

| | | | | | |
|------------------------|----------|----|---------------------------|----|-------------|
| 4L60, 4L60-E | GM 258mm | 30 | Multi-Plate Lockup, 298mm | No | GM-RK-498WC |
| | GM 265mm | 30 | Multi-Plate Lockup, 298mm | No | GM-RK-495WC |
| 4L60-E, 4L65-E, 4L75-E | GM 258mm | 30 | Multi-Plate Lockup, 300mm | No | GM-RK-408WC |
| | GM 265mm | 30 | Multi-Plate Lockup, 300mm | No | GM-RK-405WC |

Where to Buy Talk to your local converter shop or performance specialist about rebuilding with Sonnax components. Contact Sonnax anytime for comprehensive assistance with Sonnax products.

DRIVELINE

Once you've increased engine and transmission performance, get the power down to the ground with premium-quality Sonnax driveline components.

Performance Slip Yokes

Affordable, High-Quality Upgrade
for HD/HP & Everyday Builds

- Forged & fully machined from billet steel for enhanced strength & durability
- Leak-free plug tested to 40 psi for optimum sealing
- 1330 & 1350 Series yokes forged from CHROMOLY steel

Sonnax slip yokes set the standard for incredible performance and value — a winning combination you won't find anywhere else. It's the best way to greatly increase strength and durability in a wide range of high horsepower and torque capacity vehicles.

Installing Sonnax yokes in routine transmission builds also helps prevent comeback complaints like:

- Leaking from the back of the transmission
- Noise, vibration and harshness
- Clunking and shudder

Where to Buy

Purchase Sonnax slip yokes from transmission parts distributors and driveshaft shops.



**Fits GM 27-Spline,
Bushing-Style Tailshafts**

Part No. T3-3-4281HP

Length: 6.94"

Seal Diameter: 1.503"

U-Joint Series: 1350

This yoke will fit the majority of 4L60/E applications, and Sonnax offers many other sizes and styles. For help selecting the right slip yoke, visit www.sonnax.com/slip-yokes.

Aluminum Tubing & Yokes

Sonnax is America's #1 source for aluminum aftermarket driveshaft components, every piece made to exacting quality standards you can trust.

- 6061-T6 Aluminum components enhance drivetrain strength & durability
- .125" Wall tubing improves torque yield strength, helping get the power to the ground
- Precision-machined, quality parts for trouble-free performance

Where to Buy Ask for Sonnax aluminum components from your local driveshaft shop. Contact a Sonnax product specialist for help with driveshaft component selection.



TUBING

WELD YOKES

FLANGE YOKES

BONDABLE YOKES

BUILD THE **KILLER** 4L60/E

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