

Spicer® Driveshafts



SPICER®

Drivetrain Products

Service Manual

Spicer Life® Lite Series

DSSM-0500

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General Information

General Information

The description and specifications contained in this service publication are current at the time of printing. Dana reserves the right to discontinue or to modify its models and/or procedures and to change specifications at any time without notice.

Any reference to brand names in this publication is made simply as an example of the types of tools and materials recommended for use and should not be considered an endorsement. Equivalents, if available, may be used.

Important Notice

This symbol is used throughout this manual to call attention to procedures where carelessness or failure to follow specific instructions may result in personal injury and/or component damage.

Departure from the instructions, choice of tools, materials and recommended parts mentioned in this publication may jeopardize the personal safety of the service technician or vehicle operator.



 **WARNING:** Failure to follow indicated procedures creates a high risk of personal injury to the servicing technician.

 **CAUTION:** Failure to follow indicated procedures may cause component damage or malfunction.

 **IMPORTANT:** Highly recommended procedures for proper service of this unit.

Note: Additional service information not covered in the service procedures.

TIP: Helpful removal and installation procedures to aid in the service of this unit.

Always use genuine Spicer replacement parts.

Note: Interactive PDF functions may not work correctly unless viewed using the free [Adobe Acrobat Reader](#).

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General Information

Spicer Life Lite Series Features and Benefits

Note: Spicer Life Lite Series driveshafts are found on vehicles throughout the world. Therefore, this manual includes worldwide terminology.

This manual encompasses inspection, lubrication, removal and installation procedures for Spicer Life Lite Series 250 and 350 driveshaft assemblies.

Important Features of a Spicer Life Lite Series Driveshaft

Spicer offers a complete range of driveshaft solutions to meet the full spectrum of needs in medium and heavy duty applications. The Spicer Life Lite Series driveshafts have been designed and developed to stand up to the wear and tear of heavy hauling tasks. They are the first driveshafts in the industry to be compatible with advancing powertrain specifications for higher engine torque and lower axle ratios. No one does more than Spicer in meeting the needs of the marketplace.

Spicer Life Lite Series driveshafts offer:

- Longer life
- Lower lifetime management
- Increased strength for higher engine torque and lower axle ratios
- Smaller driveshaft rotating diameter

A driveshaft that transmits high torque loads must be durable and strong. Spicer uses forged steel and high strength cast yokes to provide the necessary rigidity to maintain bearing alignment under torque loads.

Spicer Life Lite Series award winning* universal joint kits are specifically designed to give extended driveshaft life. Flat-ended needle bearings are used to withstand oscillating loads while the driveshaft is rotating and to eliminate skewing in the bearing cup. Thrust washers significantly reduce end galling on trunnion ends and lower universal joint operating temperature.

Synthetic rubber seals and plastic seal guards provide lubricant retention and help prevent the entry of foreign material, significantly increasing universal joint life. The centrally located grease zerk (nipple) fitting increases the strength of the journal cross and allows more torque carrying capacity.

High-strength steel tubing is used to provide maximum torque carrying capacity at minimum practical weight. Increased tube diameter allows a higher critical speed and longer one-piece driveshafts. This increased stiffness also improves noise, vibration and harshness. New slip member booting or alternative seal can offers better protection against environmental contaminants, lubricated for the life of the product.

The new integral tube sleeve and yoke shaft design, found on heavy duty Spicer Life Lite Series designs, along with larger diameter involute splines, creates greater strength and torsional stiffness with less weight. This new design leads to improved balance and less slip effort, resulting in reduced noise and vibration for the entire driveshaft system.

Spicer Life Lite Series Inspection Warnings and Cautions

Before You Get Started

1. **ALWAYS** wear safety glasses when performing maintenance or service. Failure to wear safety glasses can result in personal injury and/or partial or complete vision loss.
2. **NEVER** go under a vehicle while the engine is running. Be sure the vehicle's engine is off, and keys are removed from ignition.
3. **NEVER** go under or work on a vehicle that is not on a level or flat surface.
4. **NEVER** work on a driveshaft without blocking the vehicle's wheels and releasing all parking brakes. See warning below.
5. **NEVER** lift a vehicle without the appropriate weightrated, vehicle-support equipment.
6. **NEVER REMOVE** a driveshaft from the vehicle without keeping the vehicle's transmission in neutral. See above warning.

 **CAUTION:** Spicer Life Lite Series driveshaft assemblies can weigh in excess of 100 pounds (46 kilograms). Be sure to use proper lifting techniques when handling Spicer Life Series™ driveshafts. More than one person may be needed when handling driveshaft assemblies.

7. **ALWAYS** use support straps to prevent the driveshaft from falling, causing injury and/or damage during the loosening or removal of any driveshaft hardware.
8. **NEVER** heat components or use sledgehammers or floor jacks to remove the driveshaft from vehicle.

Note: For driveshaft applications that have pillow blocks, dampers, parking brakes or retarders, refer to these component manufacturers' or the original equipment vehicle manufacturers' service manuals for proper procedures.

Driveline

-  **WARNING:** Failure to replace damaged driveline components can cause driveline failure, which can result in separation of the driveline from the vehicle. A separated driveline can result in property damage, serious personal injury, or death.
-  **WARNING:** Reassembly of a driveline out of original phase can cause vibration and failure of the driveline and attaching components.
-  **WARNING:** Driveshaft assemblies can weigh in excess of 100 pounds(46 kilograms). Be sure to use proper lifting techniques when handling driveshafts. More than one person may be needed when handling driveshaft assemblies.
-  **WARNING:** Never heat components, never use sledge hammers, and never use floor jacks to disassemble driveshafts. This can result in damaged, weakened, or bent components.

End Fitting

-  **WARNING:** A loose end-fitting can result in driveline failure, which can in turn lead to separation of the driveline from the vehicle. A separated driveline can lead to property damage, serious personal injury, or death.

Universal Joint

-  **WARNING:** Excessive looseness across the end of universal joint bearing cup assemblies can cause imbalance or vibration in the driveshaft assembly. Imbalance or vibration can cause component wear, which can result in separation of the driveline.
-  **WARNING:** **DO NOT** reuse bolts or use inferior grade bolts. Reuse of bolts and/or use of inferior bolts can cause driveline failure, which can result in separation of the driveline from the vehicle.
-  **WARNING:** Failure to torque bolts to specification can cause driveline failure, which can result in separation of the driveline from the vehicle.
-  **CAUTION:** Use a journal locator to avoid nicking journal cross trunnions or damaging oil seal slingers.
-  **CAUTION:** If a bearing assembly or journal cross is worn or damaged, the universal joint assembly must be replaced.
-  **CAUTION:** Be sure the snap rings are properly seated in the snap ring grooves.

Slip Member

Excessive radial looseness in the slip member in the slip member assembly can cause imbalance or vibration in the driveshaft. Imbalance or vibration can cause components to wear, which in turn can result in separation of the driveline from the vehicle. A separated driveline can cause property damage, serious personal injury or death.

Yoke (Includes Slip Yoke, Yoke Shaft, and Tube Yoke)

 **WARNING:** A loose or damaged slip yoke seal allows contaminants to invade the slip member assembly. Invasion of contaminants into the slip member assembly can degrade the grease, and damage slip member components, which can result in driveline separation.

 **WARNING:** DO NOT deform yoke cross holes by removing excessive metal. Raised metal or deformed yoke cross holes can be a cause of cross and bearing failure, which can result in separation of driveline from the vehicle.

 **WARNING:** Yoke shaft assemblies can weigh in excess of 50 pounds (23 kilograms). Be sure to use proper lifting techniques when handling yoke shafts.

Tubing

 **WARNING:** Bent or dented tubing can cause imbalance or vibration in the driveshaft assembly. Imbalance or vibration can cause component wear, which can result in separation of the driveline from the vehicle.

 **CAUTION:** Do not bend or dent the tube when handling or servicing driveshaft.

Midship Nut

 **WARNING:** DO NOT reuse the midship nut. Reuse of the midship nut can cause driveline failure, which can result in separation of the driveline from the vehicle.

 **WARNING:** DO NOT touch or disturb the micro-encapsulated adhesive found on the midship nut threads. Doing so may initiate the curing process and impair the installation of the nut. Premature curing of the micro-encapsulated adhesive will result in improper installation of the midship nut. Improper installation of this nut can cause driveline failure, which can result in separation of the driveline from the vehicle.

 **WARNING:** Failure to torque the midship nut to required specifications can cause driveline failure, which can result in separation of the driveline from the vehicle.

 **WARNING:** A loose midship nut can result in driveline failure, which can result in separation of the driveline from the vehicle.

Center Bearing

 **WARNING:** Loose center bearing bracket bolts can result in driveline failure, which can result in separation of the driveline from the vehicle.

 **WARNING:** Damaged center bearings or center bearing components can cause imbalance or vibration in the driveshaft assembly. Imbalance or vibration can cause component wear, which can result in separation of the driveline from the vehicle.

Foreign Material

-  **WARNING:** Build-up of foreign material, excessive paint, or undercoating on a driveshaft can cause imbalance or vibration in the driveshaft assembly. Imbalance or vibration can cause component wear, which can result in separation of the driveline from the vehicle.
-  **WARNING:** A contaminated slip member can result in separation from the vehicle. A separated driveline can result in property damage, serious personal injury or death.

Hardware

-  **WARNING:** Loose, missing, or damaged bearing retainers or stamped straps, retaining bolts, nuts, end fitting tangs, snap rings, or rotating bearing cups can result in driveline failure.
-  **WARNING:** A separated driveline can lead to property damage, serious personal injury, or death.
-  **WARNING:** **DO NOT** reuse bolts, straps, nuts, or damaged bearing retainers or inferior grade bolts. Reuse of bolts, straps, nuts, or damaged bearing retainers, or use of inferior grade bolts can cause driveline failure.
-  **CAUTION:** If loosening or removing bolts, always install a new strap and bolts and torque bolts to specification.

Lubrication

-  **WARNING:** A missing, loose, or fractured grease zerk (nipple) fitting or plug eliminates the ability to lubricate the universal joint. Improper or inadequate lubrication can cause driveline failure, which can result in separation of the driveline from the vehicle.
-  **WARNING:** Improper lubrication techniques can cause driveline failure, which can result in separation of the driveline from the vehicle.
-  **WARNING:** A missing, loose, damaged, or fractured plug or grease zerk (nipple) fitting can allow contaminants to invade the universal joint. Invasion of contaminants into the universal joint can degrade grease and cause universal joint damage, which can result in separation of the driveline from the vehicle.
-  **WARNING:** Incompatible greases that are applied to universal joints and/or slip members can result in driveline failure and can result in separation of the driveline from the vehicle.
-  **WARNING:** Hand tightening of grease zerk (nipple) fitting or plugs is **NOT** recommended. Failure to torque grease zerk (nipple) fittings to specifications can result in separation of the driveline from the vehicle.
-  **WARNING:** Maximum grease gun pressure should not exceed 60 psi. Excessive grease gun pressures may cause seal damage.
-  **CAUTION:** In cold temperatures, be sure to drive the vehicle immediately after lubrication. This activates the slip spline and removes excess grease. Failure to do so could cause excess grease to stiffen in the cold weather and force the plug out. The end of the spline would then be open to collect contaminants and cause the spline to wear and/or seize.
-  **CAUTION:** All slip yoke and universal joint seals should be completely purged.

Inspection Procedures

Visually inspect all input and output end-fitting retaining nuts or bolts for any gaps between mating surfaces. If gaps are present, consult transmission, axle or transfer case original equipment manufacturers' service and maintenance manuals for proper fastener specifications.

Visually inspect for damaged bearing retainers or stamped straps, loose bearing retainer bolts or strap bolts, loose companion flange bolts and nuts, loose or missing spring tabs or spring tab bolts, damaged tangs on end fittings, damaged or missing snap rings, and rotating bearing cups.

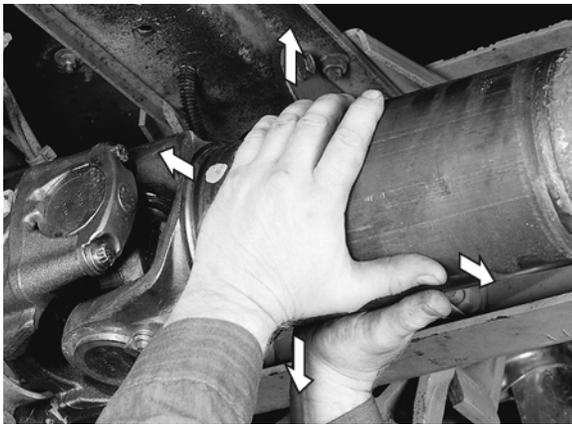
If any of these situations are evident, replacement of the components is necessary. Refer to the removal and installation sections of this manual for proper replacement procedures.

Universal Joints

Note: The following procedures are to be performed prior to any lubrication of universal joints or slip members. The addition of lubricant can mask the looseness in a component that is beginning to show wear and may be in need of replacement.

1. Check for excessive looseness across the ends of the universal joint bearing cup assemblies and trunnions. Take hold of the inboard yoke on the driveshaft with both hands. Try to move the yoke vertically and horizontally.

There should be less than .006" (.15mm) movement in the universal joint relative to the inboard or outboard yokes. If looseness is greater than .006" (.15mm), the universal joint kit may need to be replaced.

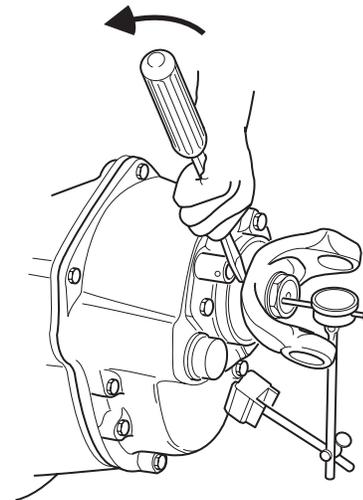


IMPORTANT: If the movement of the driveshaft is greater than .006", the carrier assemblies input shaft and/or output shaft ends play must be checked to make sure they are within specification. Endplay readings that are out of specification must be corrected before an accurate driveshaft reading can be taken. Refer to the Input/Output Shaft Endplay Inspection procedure.

WARNING: Excessive looseness across ends of universal joint bearing cup assemblies can cause imbalance or vibration in the driveshaft assembly. Imbalance or vibration can cause component wear, which can result in separation of the driveline from the vehicle.

Check Input Shaft End-Play (Forward Axle)

- a. Position dial indicator at yoke end of input shaft.
- b. Push on input shaft and zero dial indicator.
- c. Using pry bar, move input shaft axially and measure/record end-play.



Add shims to increase end-play

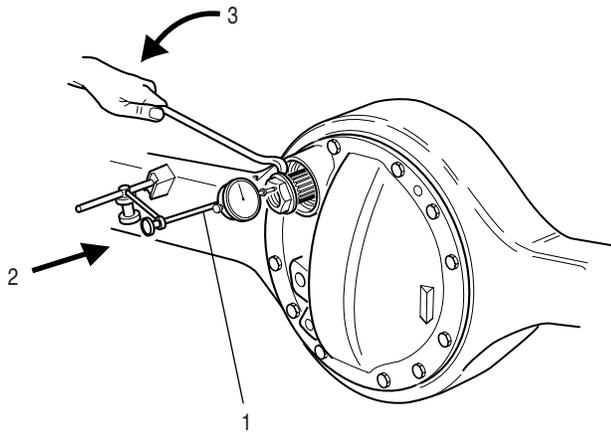
Note: Input and output shaft endplay specifications will vary between model. Refer to manufacturer's service manual for correct endplay specifications.

Remove shim to decreased end-play

Measured end-play (Step 3)	0.015" – 0.015"
Desired end-play (New Parts)	0.003" to 0.007"
Remove shims to provide desired end-play	0.012" to 0.008"

Check Output Shaft End-Play (Forward Axle)

- Position dial indicator at yoke end of input shaft.
- Push on output shaft and zero dial indicator.
- Using pry bar, move input shaft axially and measure/record end-play.



Note: The output yoke can be installed when taking end-play measurements.

- Correct end-play for new assembly is .001" to .015".

Grease Zerk Inspection

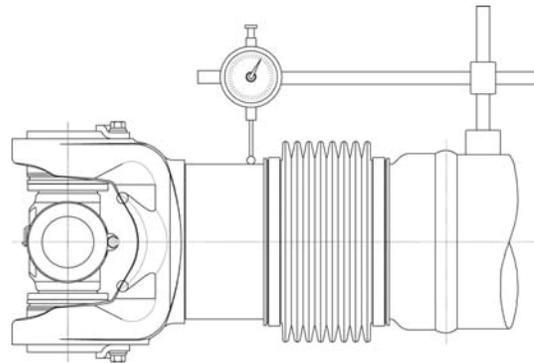
Check for presence of all grease zerk fittings. Grease zerk fittings should not be loose, fractured or missing.



- If grease zerk fitting is loose, tighten to required specifications.
- If grease zerk fitting is fractured, replace grease zerk fitting and tighten to required specifications.
- If grease zerk fitting is missing, the entire universal joint kit needs to be replaced.

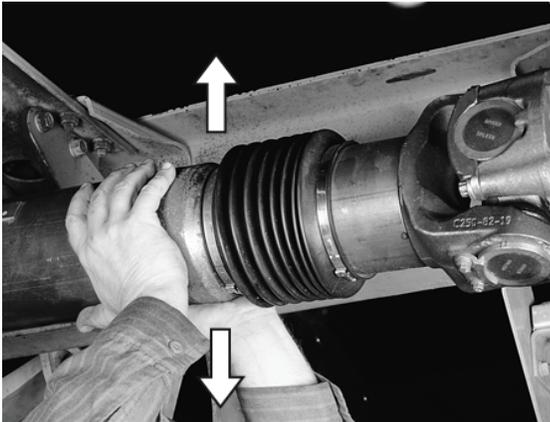
Slip Member Assembly Inspection

1. Check the slip member assembly for excessive radial looseness. Using a dial indicator, take hold of the tubing near the slip member with both hands and try to move vertically, up and down relative to the ground.



2. Arrange dial indicator with magnetic base one-quarter inch (1/4") from the driveshaft's tube weld. Dial indicator should be firmly mounted on the tube so that no movement of the dial indicator base is allowed.
3. Extend dial indicator arm from the base, across the slip member boot, allowing the dial indicator to contact the yoke shaft tube one quarter inch (1/4") off the opposite side of the boot from where the magnetic base is mounted. Dial indicator's arm should be running parallel to the driveshaft.

4. Apply effort perpendicular to shaft axis making note of total indicator travel. Allowable indicator travel is .000-.012 in.



⚠ WARNING: Excessive radial looseness can cause imbalance or vibration in the driveshaft assembly. Imbalance or vibration can cause component wear, which can result in separation of the driveline from the vehicle.

5. Check the yoke shaft boot. Make sure the boot is properly attached to the yoke shaft assembly and splined sleeve. Visually inspect for boot tears, punctures, loose clamp and clamp damage.

If any of these situations are evident, replace damaged components and measure slip joint movement.



Tube Inspection

1. Check the driveshaft for bent or dented tubing. If either of these situations is evident, replacement of the complete driveshaft assembly or tube is necessary.

Make certain there is no buildup of foreign material on driveshaft.

If found, buildup should be removed carefully to avoid damaging the driveshaft.

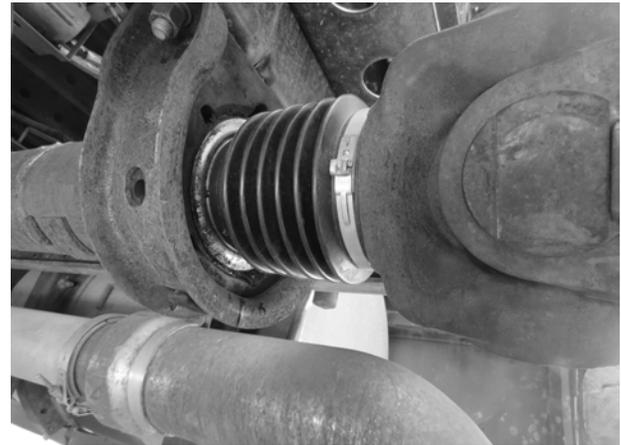
- When removing dirt or mud, rinse with water.
- When removing tar or undercoating, use mineral spirits or any appropriate solvent.

Center Bearings Inspection

1. Visually inspect all center bearings, end-fitting midship nuts for any gaps between the mating surfaces.

Note: Be sure to repeat steps 2 and 3 for all center bearing end fittings for broken back and backlash.

2. Inspect the center bearing bracket bolts for looseness.



Note: If looseness is evident, retighten center bearing bracket bolts. Consult the vehicle manufacturers' specifications for proper bolt torque. Check the alignment of the bracket before tightening the bolts. Bracket should not be skewed.

3. Visually inspect the center bearing rubber cushion for damage. Make sure the slingers are not rubbing against the rubber cushion. Verify that the rubber cushion is properly seated in the metal bracket.

Lubrication Procedures

Spicer Life Lite Series Lubrication Warnings and Cautions

Before You Get Started

1. **ALWAYS** wear safety glasses when performing maintenance or service. Failure to wear safety glasses can result in personal injury and/or partial or complete vision loss.
2. **NEVER** go under a vehicle while the engine is running. Be sure the vehicle's engine is off, and keys are removed from ignition.
3. **NEVER** go under or work on a vehicle that is not on a level or flat surface.
4. **NEVER** work on a driveshaft without blocking the vehicle's wheels and releasing all parking brakes. See warning below.
5. **NEVER** lift a vehicle without the appropriate weightrated, vehicle-support equipment.
6. **NEVER REMOVE** a driveshaft from the vehicle without keeping the vehicle's transmission in neutral. See above warning.

 **CAUTION:** Spicer Life Lite Series driveshaft assemblies can weigh in excess of 100 pounds (46 kilograms). Be sure to use proper lifting techniques when handling Spicer Life Lite Series driveshafts. More than one person may be needed when handling driveshaft assemblies.

7. **ALWAYS** use support straps to prevent the driveshaft from falling out of vehicle during the removal and installation process.
8. **ALWAYS** wear protective gloves when applying grease to slip joints or other driveshaft components.
9. **NEVER** heat components or use sledgehammers or floor jacks to remove the driveshaft from vehicle.

Note: For driveshaft applications that have pillow blocks, dampers, parking brakes or retarders, refer to these component manufacturers' or the original equipment vehicle manufacturers' service manuals for proper procedures.

 **WARNING:** Failure to release all parking brakes and failure to place transmission in neutral can result in torque being applied to the driveshaft. Disconnecting a driveshaft with applied torque can result in property damage, serious personal injury or death.

 **WARNING:** Inadequate lubrication can cause driveline failure which can result in separation of the driveline from the vehicle. A separated driveline can result in property damage, serious personal injury or death.

 **WARNING:** Incompatible lubricants/greases which are applied to universal joints and/or slip members, can result in failure of the driveline and can result in separation of the driveline from the vehicle.

 **WARNING:** To prevent serious eye injury, always wear safety glasses when performing maintenance or service. Failure to wear safety glasses could result in serious personal injury, and/or partial or complete vision loss.

Spicer Life Lite Series Lubrication

WARNING: ALWAYS use support straps to prevent the driveshaft from falling out of the vehicle. Failure to use a support straps can cause damage to the driveshaft or result in property damage, serious personal injury or death. **DO NOT** attach the support straps to fuel lines, oil lines, brake lines, or wiring. **DO NOT** entangle fuel lines, oil lines, brake lines or wiring in the support straps.

Lack of proper lubrication is one of the most common causes of universal joint and slip member problems. When properly applied, relubable Spicer Life Lite Series universal joints which are adequately relubricated at recommended intervals will meet or exceed vehicle operation requirements.

Note: Spicer Life Lite Series replacement universal joint kits contain only enough grease to provide needle roller bearing protection during storage. It is therefore necessary to completely lubricate each replacement kit prior to assembly into yokes.

Note: There are numerous instances when special lubrication is required by vehicle specifications or customer request. The lubrication recommendations listed in this manual are prescribed by Spicer Driveshaft Division engineering. Any alternate lubricants, or lubrication procedures, are the responsibility of the user.

Inadequate relubrication intervals and failure to properly lubricate the universal joints will cause universal joint failures. Proper relubrication flushes the universal joints, thus removing abrasive contaminants from the bearings. Relubable slip members must also be adequately relubricated to prevent slip member failure.

WARNING: Inadequate relubrication can cause driveline failure which can result in separation of the driveline from the vehicle.

Recommended Lubricants for Relubable Universal Joints and Slip Members

Standard Application

Spicer recommends that the following requirements be met for any lubricant that will be used to service most vehicular, industrial and all auxiliary driveshaft applications.

Note: Refer to Dana information bulletin number J3295 for additional grease specification guidelines.

CAUTION: Failure to use Dana recommended grease specification may cause premature component wear and void warranty coverage.

- Meet LB classification
- Use a good quality E.P. (extreme pressure) grease
- Timkin Test Load – 50 lbs/23Kg minimum
- Meeting N.L.G.I. (National Lubricating Grease Institute), E.P., Grade 2 specifications
- Grease must have an operating range of +325 F to - 10 F (+163 C to -23 C)

Consult your local lubricant source for greases that meet these specifications.

WARNING: Incompatible lubricants/greases which are applied to universal joints and/or slip members, can result in failure of the driveline and can result in separation of the driveline from the vehicle.

Grease Compatibility

When greases made from different thickeners are mixed, the mixture may result in lower service performance or physical properties than either of the original component products.

This reduction in lubricant performance is called incompatibility.

It may show up in any of several areas, such as:

1. Lower heat resistance;
2. Change in consistency, usually softening; or
3. Decrease in shear stability.

Mixtures which show none of these changes are considered compatible. Incompatibility is not always caused by the thickener, since each of the greases in the mixture is a complete package - thickener, fluid, and additives.

Sometimes the thickener of one grease is incompatible with the fluid or the additives present in the second grease. If the mixture proves to be significantly softer, less shear stable, or less heat resistant than the original grease, the mixture shall be deemed incompatible.

Incompatibility is best determined in service or in service related tests; it is not predictable. Certain thickener combinations often have been found unsatisfactory and are generally so recognized. These would include lithium and sodium greases and organo-clay and most soap greases. Contact your local lubricant supplier for grease compatibility information.

To help reduce the effects of incompatible greases, make sure to thoroughly purge all four bearing seals on each universal joint with the new grease. Purge seals until the fresh grease is visible on the outside of all four bearing seals.

It is recommended that all purged grease be wiped clean to prevent discharge into the general environment.

Intervals for Universal Joints

Lubrication intervals vary depending on the service requirements and operating conditions of the vehicle or machine. The table, below, shows the recommended universal joint lubrication intervals for various types of service.

Universal Joint Lubrication Intervals

Series	Cycle*	City	On-Highway	Linehaul	Off-Highway
Lite Series (Heavy Duty) Lite 250 & Lite 350	First Lubrication	100,000 mi (160,000 km) or 1 year	350,000 mi (560,000 km) or 3 years	350,000 mi (560,000 km) or 3 years	100,000 mi (160,000 km) or 1 year
	Relubrication	25,000 mi (40,000 km) or 6 months	100,000 mi (160,000 km) or 6 months	100,000 mi (160,000 km) or 6 months	25,000 mi (40,000 km) or 6 months

IMPORTANT: *Slip members are booted and permanently lubricated.

FIRST LUBRICATION - After initial miles or time is reached, the u-joints must be relubricated.

RELUBRICATION - Once greased, this relubrication interval must be followed.

We recommend relubrication with Chevron Ultra-Duty EP-2 or a compatible lithium-based grease meeting N.L.G.I. Grade 2 specifications with an operating range of +325 °F/+163 °C to -10 °F/-23 °C.

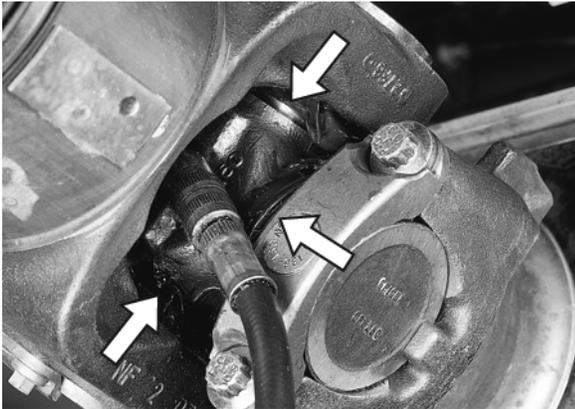
Note: We recommend that all driveshafts be inspected for wear and damage every time the vehicle is serviced. This includes any scheduled and/or unscheduled maintenance that occurs within the driveshaft lube intervals.

City	All applications that require a minimum of 90% of operation time within the city limits
On-Highway	All applications requiring less than 10% of operation time on gravel, dirt, or unpaved roads
Linehaul	100% of operation time on smooth concrete or asphalt
On/Off-Highway	All applications operating primarily on paved roads, but requiring more than 10% of operating time on gravel, dirt, or unpaved roads

Universal Joints Lubrication

1. Use the recommended lubricant to purge all four seals of each universal joint. This flushes abrasive contaminants from each bearing assembly and assures proper filling of all four bearings.

! IMPORTANT: Make sure fresh grease is evident at all universal joint bearing seals.



2. If any of the seals fail to purge, try to push the trunnion away from the bearing cup while applying grease. On two side zerk fittings, try greasing from the opposite side of the fitting.

Note: Due to sealing capability of the Spicer Life design, there may be one or more bearing assembly seals that will not purge.

3. If any bearing cup assemblies fail to purge, releasing seal tension may be necessary.

Releasing Universal Joint Bearing Seal Tension

Quick Disconnect™ Spring Tab Style

It will be necessary to have additional bearing retainer or stamped strap bolts and stamped straps in order to complete the following instructions.

1. Utilizing a brass hammer and wearing safety glasses, sharply strike inboard yoke on lug ear once to firmly seat bearing against spring tab and relieve tension across span. Rotate shaft 180 degrees and repeat procedure on opposite lug ear.
2. Apply grease gun pressure and purge all four bearings until fresh grease is seen at all four bearing seals.
3. If striking lug ears does not cause purging, remove and discard spring tab bolts and spring tabs.

4. With a marking stick, paint marker or other legible device, mark all bearing positions in relation to yokes effected universal joint. This assures proper reassembly of the driveshaft into the vehicle, in its original position. See Warning Below.

! WARNING: Reassembly of a driveline out of original phase can cause vibration and failure of the driveline and attaching components.



5. Working at the effected universal joint, support the driveshaft with a support strap. Attach support straps to frame rails or some structural part of the vehicle.

6. Remove the c-clips, bearing retainers, and bolts at the effected universal joint.

Lite 250, 350

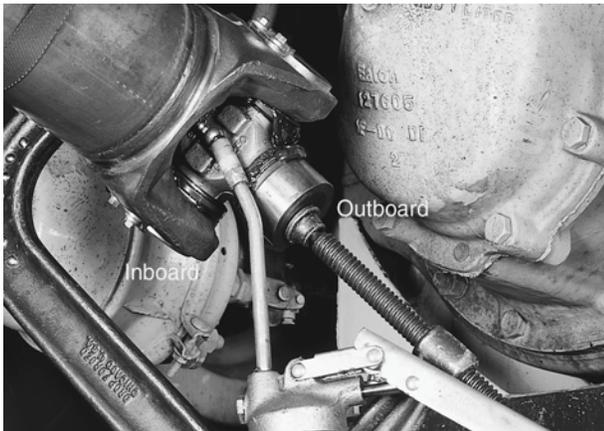
Thread Size	Head Size*	Bolt Torque	
		N•m	Lb. Ft.
12 mm - 1.25	12 mm 12 point	250	185

* Spicer bolts are specially heat-treated.

! IMPORTANT: DO NOT substitute with inferior grade bolts.

7. It may be necessary to unseat bearing cup assemblies by tapping on yoke or bearing cup with a softfaced hammer. Once the bearing cup assemblies are free, allow the driveshaft to rest on support strap.

8. Apply a c-clamp around the outboard bearings. Apply grease gun pressure. Completely purge both inboard bearings.



9. If bearings fail to purge, slightly loosen c-clamp and reapply grease gun pressure until both outboard bearings purge.
10. After all four bearings purge fresh grease, retighten c-clamp to squeeze out excess grease and wipe clean. This will ease installation of universal joint kit back into yoke. Install universal joint kit in the yoke using new bearing retainer bolts, and torque bolts to the required specifications.
11. If the bearings still will not purge, complete replacement of the universal joint kit is required.

Slip Joint Lubrication

Lubrication Procedure for Slip Members

- ⚠ CAUTION:** In cold temperatures, be sure to activate the slip member by driving the vehicle sufficiently to cause displacement of the grease prior to its stiffening. Failure to do so could cause the excess lubricant to stiffen in the cold weather and force the welch plug out. The end of the spline would then be open to collect contaminants and can result in driveline failure.

Lubrication for Center Bearings

All Spicer manufactured center bearings are permanently lubricated. No attempt should be made to add or change grease with the bearing itself.

Note: The Lite series slip joint is greased for life. There is no need to add grease unless you are replacing individual components.

Driveshaft

Spicer Life Lite Series Driveshaft Removal Warnings and Cautions

Before You Get Started

1. **ALWAYS** wear safety glasses when performing maintenance or service. Failure to wear safety glasses can result in personal injury and/or partial or complete vision loss.
2. **NEVER** go under a vehicle while the engine is running. Be sure the vehicle's engine is off, and keys are removed from ignition.
3. **NEVER** go under or work on a vehicle that is not on a level or flat surface.
4. **NEVER** work on a driveshaft without blocking the vehicle's wheels and releasing all parking brakes. See warning below.
5. **NEVER** lift a vehicle without the appropriate weight-rated, vehicle-support equipment.
6. **NEVER REMOVE** a driveshaft from the vehicle without keeping the vehicle's transmission in neutral. See above warning.

 **CAUTION:** Spicer Life Lite Series driveshaft assemblies can weigh in excess of 100 pounds (46 kilograms).

7. Be sure to use proper lifting techniques when handling Spicer Life Lite Series driveshafts. More than one person may be needed when handling driveshaft assemblies.
8. **ALWAYS** use support straps to prevent the driveshaft from falling out of vehicle during the removal and installation process.

 **WARNING:** Reassembly of a driveline out of original phase can cause vibration and failure of the driveline and attaching components. Failure of a driveline can result in separation of driveline from the vehicle, which can result in property damage, serious personal injury or death.

 **WARNING:** Attaching or entangling support straps to fuel, oil or brake lines or wiring can result in their damage. Damaged fuel, oil or brake lines or wiring can result in failure of the vehicle, which can result in property damage, serious personal injury or death.

 **WARNING:** **DO NOT** reuse bearing retainer bolts, damaged bearing retainers, or use inferior grade bolts. Reuse of bearing retainer bolts, damaged bearing retainers or the use of inferior grade bolts can cause driveline failure, which can result in separation of driveline from the vehicle. A separated driveline can result in property damage, serious personal injury or death. **DO NOT** deform yoke cross holes by removing excessive metal. Raised metal or deformed yoke cross holes can be a cause of cross and bearing failure, which can result in separation of driveline from vehicle. A separated driveline can result in property damage, serious personal injury or death.

 **WARNING:** **DO NOT** reuse flange bolts, washers or nuts or use inferior grade bolts. Reuse of flange bolts, washers or nuts or use of inferior grade bolts can cause driveline failure, which can result in separation of driveline from the vehicle. A separated driveline can result in property damage, serious personal injury or death.

 **WARNING:** Driveshaft assemblies can weigh in excess of 100 pounds (46 kilograms). Make sure to use proper lifting techniques when handling driveshafts. More than one person may be needed when handling driveshaft assemblies.

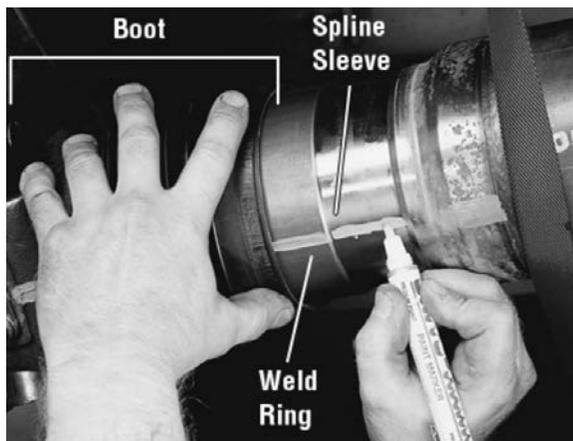
 **WARNING:** Hand tightening of grease zerk fittings or plugs is **NOT** recommended. Grease zerk fittings or plugs will eventually vibrate loose and fall out of journal. Prolonged operation with missing grease zerk fittings allows contaminants into the universal joint. Invasion of contaminants into the universal joint can degrade the lubricant and cause universal joint damage, which can result in separation of the driveline from the vehicle. A separated driveline can result in property damage, serious personal injury or death.

Driveshaft Removal

Refer to the transmission, axle or transfer case original equipment manufacturers' service and maintenance manuals for removal procedure.

Removal Procedures for Driveshaft Assembly

1. Mark Driveshaft ("Phasing Marks") It is imperative to mark all the mating components of a driveshaft, as illustrated below. Mark the driveshaft with a marking stick, paint marker or other legible marking device. In addition, be sure to mark all bearing positions, spline positions, shaft locations and all bearing retainers. This assures proper reassembly of the driveshaft into the vehicle, in its original position.



2. Be sure to **ALWAYS** use support straps to prevent the driveshaft from falling out of the vehicle.
3. Remove the bearing retainers or c-clips.
4. It may be necessary to unseat bearing cup assemblies by tapping on yoke or bearing cup with a softfaced hammer. Once the bearing cup assemblies are free, collapse the driveshaft until both bearing assemblies clear the open end yoke cross holes. Allow the driveshaft to rest on support strap.
5. When removing the rear driveshaft, remove the shaft from the slip joint before you remove the center bearing.

U-joint Removal

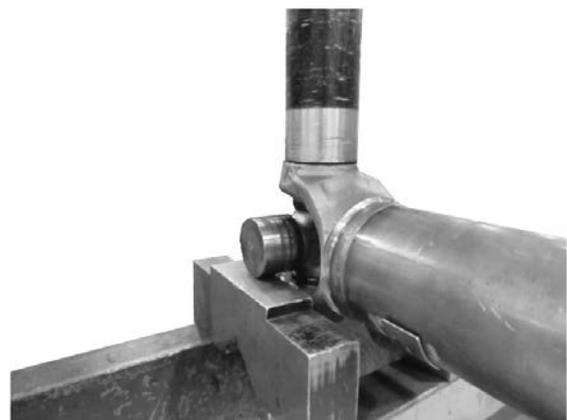
1A. Snap Ring:

Use snap-ring pliers to remove both snap rings.



1B. For Quick Disconnect™ Style:

Remove spring tab bolts and discard, and remove outboard bearing cap assemblies.



- Now rotate the driveshaft 180 degrees so you can press the other bearing cup.



- The bearing cup is not designed to drop out of the yoke. A chisel can be used to finish removing the bearing cups.
- Tiger Tool's U-joint bearing cup puller P/N 10107 can be used to remove SPL350 cups without damage.



- Inspect the yokes for damage before reassembly. A fine-toothed file and/or emery can be used to remove raised metal or fretting.
- Remove bearing retainers or stamped straps and bolts at the front end.
- Inspect all end yoke cross hole surfaces and bolt hole threads for damage. If the bolt hole threads are damaged, the yoke must be replaced.

- Inspect for raised metal or fretting on open yoke cross holes can be removed with a fine-toothed file and/or emery cloth.



Inspect the end yoke cross holes for distortion and damage.

Inspect Companion Flange/Flange Yokes

- Inspect all flange bolt hole threads or through holes for damage. If the bolt hole threads or through holes are damaged, the flange must be replaced.

Note: For removal procedures for companion flanges, refer to the original equipment manufacturers' service and maintenance manuals. For removal procedures for flange yokes, see removal of universal joints in this manual.

- Inspect all flange faces for galling or damage. If damaged, the flange must be replaced.

Grease Zerk Removal and Installation

Remove Grease Zerk Fitting

- Tilt the universal joint kit or flange yoke and universal joint kit to allow access to effected grease zerk fitting. Using pliers or an open-ended wrench, turn grease zerk fitting counterclockwise until it is removed from the journal cross. Discard the grease zerk fitting.

Grease Zerk Fitting Only

Check for threads in the journal. If threads are present, proceed to next step. If threads are not present, replacement of universal joint is necessary.

- Thoroughly wipe clean the grease zerk fitting or plug threaded hole.

Install New Grease Zerk Fitting or Plug

- Install new grease zerk fitting or plug. Tighten to minimum 15 ft. lbs. (20 Nm). Then continue to turn only until grease zerk fitting is correctly positioned.

SPL250/350 Lite Center Bearing Replacement

Required Tools & Equipment:

- 3M Scotch-Weld DP420NS Black Epoxy Adhesive (50 ml) 7100148758 (sold separately – Spicer part # 10152047)
- 3M EPX Plus II Applicator 7100148764 (sold separately – Spicer part # 10152053)
- Spicer 350CB03X center bearing kit (Kit includes 3M mixing nozzle 7100104991, 2 slingers, center bearing assembly, and instructions)
- Cleaning solvent (Brake Clean or Acetone)
- Split bearing puller or 3 jaw gear puller
- 3/8-inch wide paint brush
- Scraper
- Rotary tool with wire brush
- 1/2 inch drive impact
- Dead blow hammer

Center Bearing Removal

1. Prior to removing the center bearing from the coupling shaft locate the yellow paint stripe on the outer diameter of the splined sleeve. This mark is used for alignment of the rear driveshaft for installation. This paint stripe may be removed during the center bearing replacement process and will need to be re-marked when completed. Transfer the mark to the opposite side of the center bearing as a reference.



2. Remove the metal bracket from the center bearing by grasping the metal bracket on each side and rotating it as shown.



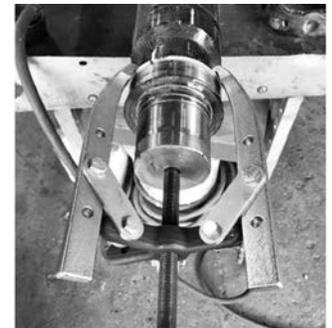
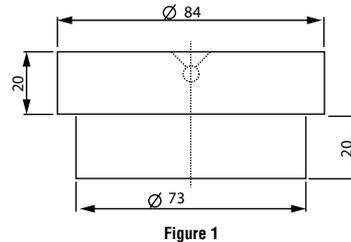
CAUTION: Wear gloves to protect your hands from any burrs and sharp edges.

3. Use a cut-off wheel or hacksaw to cut through the rubber isolator and metal support ring to remove the rubber isolator from the bearing.



CAUTION: Wear protective eyewear to protect from flying debris.

4. Remove the bearing and slingers from the splined sleeve using a split bearing puller or 3 jaw gear puller. Note: The puller needs to react against the end of the splined sleeve to remove the bearing and slingers. It is recommended that a centering tool be used in the end of the splined sleeve to prevent damage to the sleeve and spline coating. Refer to Figure 1 for dimension details of a recommend design.

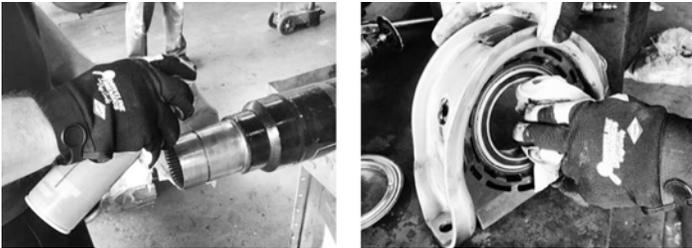


CAUTION: Do not use an air chisel to remove the bearing from the sleeve to prevent damage to the splined sleeve.

5. Clean the adhesive from the outer diameter of the splined sleeve using a scraper and wire brush or wire wheel to completely remove all the original adhesive residue. Use caution to prevent damage to the knurled surface.



6. Clean the outer diameter of the splined sleeve, inner race of the new bearing, and inner diameter of the new slingers with a non-residue solvent such as brake clean or acetone to remove any dirt or oil residue. Wipe the areas a second time with the solvent using a clean towel.



Center Bearing Installation

1. Assemble the 3M DP420NS Black adhesive cartridge and mixing nozzle into the dispenser and dispense a small amount of adhesive onto a paper towel to prepare the adhesive for use.



Note: The 3M DP420NS Epoxy has an 18-month shelf life. Be sure to verify that the epoxy is within this shelf life using the date code on the back of the cartridge shown in the photo below. The first digit (9) represents the last digit of the year of manufacture and the next three digits are the day of that year (154st day of 2019).

2. Apply a single 1/8-inch bead of DP420NS adhesive to the smooth area next to the shoulder where the first slinger is located. Spread the adhesive evenly over the slinger area using a small paint brush.



Note: 3M DP420NS Black Epoxy has a 30-minute working time. Have the new parts and tools ready for re-assembly as per Step 6 above.

3. Install the first slinger with the large diameter toward the bearing by sliding it over the sleeve with a twisting motion. Be sure that the slinger is fully seated against the shoulder on the sleeve.



4. Apply a two 1/8-inch beads of the DP420NS adhesive around the splined sleeve over the knurled area of the sleeve and spread it evenly using the brush.



5. Slide the new center bearing over the splined sleeve and seat it completely against the slinger.



Note: The bearing is a very close slip fit on the splined sleeve and may require tapping into place using a piece of tubing and hammer. A section of 4-inch diameter schedule 40 PVC pipe works well to prevent damage to the bearing seal.

6. Apply a single 1/8-inch bead of DP420NS adhesive around the splined sleeve in the area of the outer slinger and spread it evenly over the slinger area using the brush.



7. Install the second slinger with the large diameter toward the bearing by sliding it over the sleeve with a twisting motion. Be sure that the slinger is fully seated against the bearing.



8. Rotate the bearing to ensure that it moves freely.
9. Check the yellow alignment mark and re-mark if necessary, by locating the missing tooth in the splined sleeve with your finger and marking the corresponding location on the OD of the splined sleeve with a paint marker.
10. Allow the coupling shaft assembly to set for 3 hours to allow the adhesive to cure for handling prior to reinstallation of the shaft into the truck.
11. After installation allow the adhesive to cure for an additional 3 hours (6 hours total) before operating the vehicle.

Spicer Life Lite Series Driveshaft Installation Warnings and Cautions

Before You Get Started

1. **ALWAYS** wear safety glasses when performing maintenance or service. Failure to wear safety glasses can result in personal injury and/or partial or complete vision loss.
2. **NEVER** go under a vehicle while the engine is running. Be sure the vehicle's engine is off, and keys are removed from ignition.
3. **NEVER** go under or work on a vehicle that is not on a level or flat surface.
4. **NEVER** work on a driveshaft without blocking the vehicle's wheels and releasing all parking brakes. See warning below.
5. **NEVER** lift a vehicle without the appropriate weightrated, vehicle-support equipment.
6. **NEVER REMOVE** a driveshaft from the vehicle without keeping the vehicle's transmission in neutral. See above warning.

 **CAUTION:** Spicer Life Lite Series driveshaft assemblies can weigh in excess of 100 pounds (46 kilograms). Be sure to use proper lifting techniques when handling Spicer Life Lite Series driveshafts. More than one person may be needed when handling driveshaft assemblies.

7. **ALWAYS** use support straps to prevent the driveshaft from falling, causing injury and/or damage during the loosening or removal of any driveshaft hardware.
8. **NEVER** heat components or use sledgehammers or floor jacks to remove the driveshaft from vehicle.

 **WARNING:** Reassembly of a driveline out of original phase can cause vibration and failure of the driveline and attaching components. Failure of a driveline can result in separation of driveline from the vehicle, which can result in property damage, serious personal injury or death.

 **WARNING:** Rotating bearing cup assemblies can result in yoke cross hole wear and distortion. Distorted yokes can result in separation of the driveline from the vehicle.

 **WARNING:** Reuse of spring tab bolts or failure to properly tighten spring tab bolts to required specifications can cause the driveline to loosen and separate from the vehicle.

 **WARNING:** Failure to torque the midship nut to required specifications can cause driveline failure, which can result in separation of the driveline from the vehicle.

 **WARNING:** Reuse of boot clamps or failure to properly tighten boot clamps to required specifications could allow intrusion of contaminants onto slip member and can cause driveline failure, which can result in separation of driveline from the vehicle.

 **WARNING:** Attaching or entangling support straps to fuel, oil or brake lines or wiring can result in their damage. Damaged fuel, oil or brake lines or wiring can result in failure of the vehicle.

 **WARNING:** Improperly seated bearing cup assemblies can cause driveline failure, which can result in separation of the driveline from the vehicle.

 **WARNING:** Failure to install new bolts and to torque bolts to specification can cause driveline failure, which can result in separation of the driveline from the vehicle.

 **WARNING:** Installation of a driveline out of original phase can cause vibration and failure of the driveline and attaching components. Failure of a driveline can result in separation of the driveline from the vehicle.

U-joint Installation

1. Using a high quality E.P grade # 2 grease, wipe each bearing cup assembly with grease.

Note: We recommend relubrication with Chevron Ultra-Duty EP-2 or a compatible lithium-based grease meeting N.L.G.I. Grade 2 specifications with an operating range of +325 F/+163 C to -10 F/-23 C.



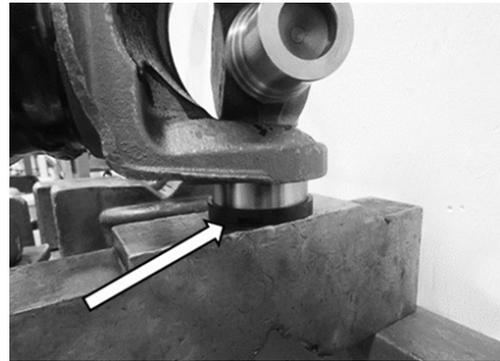
2. Install the U-joint into the tube yoke.



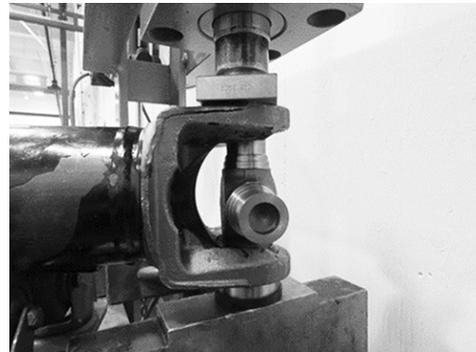
3. Hold the U-joint so that one of the trunnions is protruding through the bore of the yoke. Place one of the bearing cups over the trunnion. Use the U-joint to align the bearing cup in the bore. With a dead blow hammer, start the bearing cap in the bore.



4. Place the assembly into a press. Place the black plastic depth tool that comes in the U-joint kit, under the bottom bearing cup.



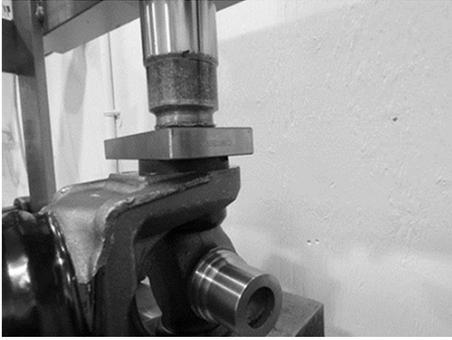
5. Now press the top of the yoke until the bottom contacts the depth tool.



6. We can now flip the driveshaft assembly over to replete this process on the other end. After starting the bearing cup in the bore place the other depth tool on the top bearing cup.



7. Now press until seated.

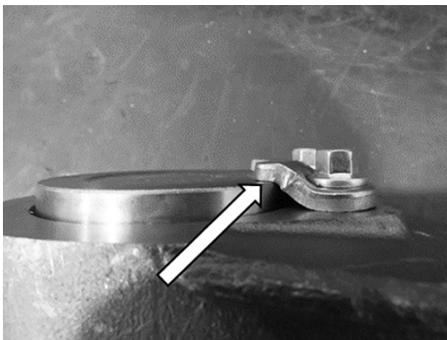


⚠ IMPORTANT: Only use as much force as it takes to seat the depth tool against the yoke. Do not over press.

8. Remove the driveshaft from the press and install the retaining tab and NEW bolts on both ends of the U-joint.

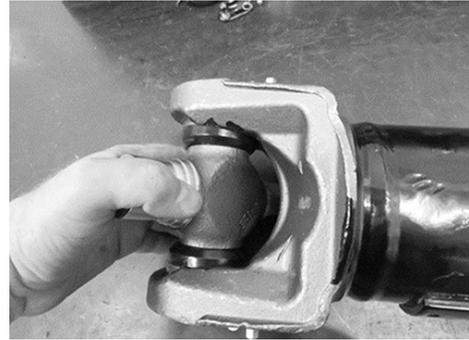


9. Snug the bolts and look for proper installation depth. The retaining tab should sit flush to the top of the bearing cup, no gaps.



⚠ IMPORTANT: If the bearing cups are not properly aligned in the yoke, take the assembly back to the press and adjust. **⚠**

10. With your hand, rotate the u-joint in the yoke. There should be some resistance. If the U-joint is hard to turn, disassemble and inspect for skewed or downed rollers.



11A. Spring Tab - Torque the bolts to specifications.



SERIES	THREAD SIZE	HEAD SIZE	BOLT Nm	TORQUE LB. FT.
SPL250	8mm x 1.00	8mm, 6 point	34-41	25-30
SPL350	8mm x 1.00	8mm, 6 point	34-41	25-30

11B. Spring Tab - Seat installed snap rings into the groove using a small chisel or punch.

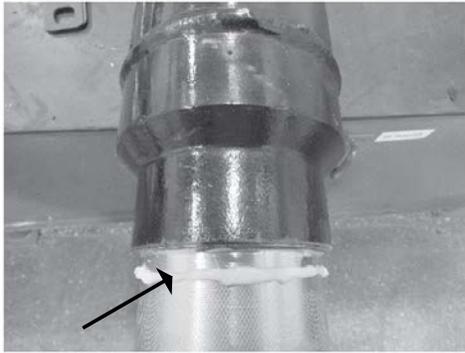


Center Bearing Installation

1. Wipe the bearing surface of the midship tube with fine emery cloth and a cleaning solvent to ensure that all the old glue has been removed.

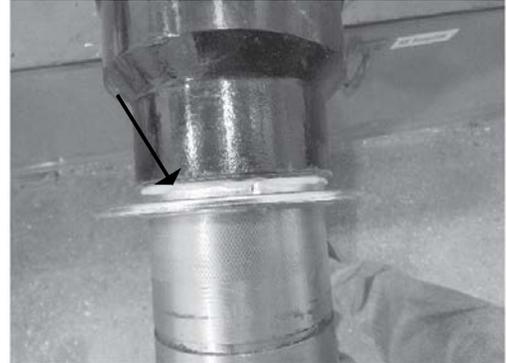


2. Apply a 1/8" bead of 3M Scotch-Weld DP405 adhesive to the midship tube where the inner slinger will seat.

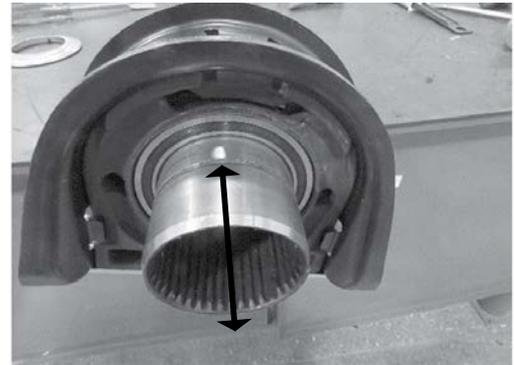


⚠ WARNING: There is no substitute for the 3M Scotch-Weld DP405 adhesive. Any other product may cause premature failure of driveshaft components.

3. Install the new inner slinger on the midship tube. Make sure the slinger is seated against the shoulder of the midship tube.



The center bearing assembly needs to be test fitted to the midship tube before applying the bearing adhesive. The center bearing should slide on easily, maybe a couple taps with a hammer.



4. We can now apply adhesive to the surface where the center bearing will sit. Apply two 1/8" beads of 3M Scotch-Weld 405 around the diameter of the tube. Spread the adhesive evenly across the tube.
5. Install the bearing until it contacts the inner slinger. Don't worry about excess glue piled up between the slinger and bearing, it won't cause a problem.



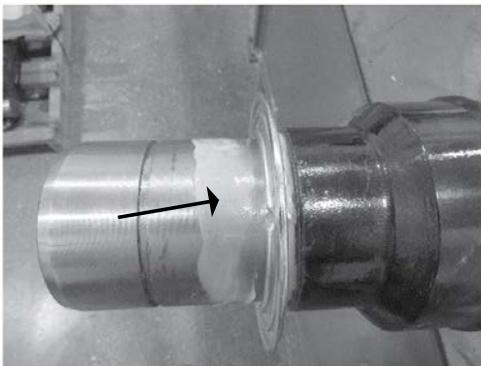
6. Before we install the outer slinger, we need to apply another 1/8" bead of adhesive where the slinger will sit on the tube.



7. Now install the outer slinger tight against the center bearing and let the assembly dry for no less than 30 minutes.



⚠ IMPORTANT: You must wait 30 minutes for the glue to set before the driveshaft is reassembled in the truck.



Slip Member and Boot Installation

1. Clean **ALL** grease from yoke shaft and spline sleeve. Make sure grease-cutting solvent does not intrude into the tube through the vent hole in the spline sleeve plug. Be sure the phasing marks made during disassembly are not removed.



2. After all traces of grease and cutting solvent have been removed from the yoke shaft and spline sleeve, apply half of the grease provided to the yoke shaft splines and the other half to the spline sleeve, cover the entire splined surface.



3. Position a clamp on each end of the new boot. Slide the boot onto the grease-free yoke shaft shoulder.
- 6.

⚠ WARNING: Failure to properly install and tighten boot clamp could allow intrusion of contaminants and can cause driveline failure, which can result in separation of the driveline from the vehicle.

4. Before the driveshaft is completely installed in the vehicle, slowly collapse and extend the driveshaft to make sure the boot clamp is stationary. If the clamp is not stationary, recheck for proper clamp torque. If clamp is still not stationary, repeat disassembly and assembly procedure. **DO NOT** reuse clamp.

Install Driveshaft

1. Before installing the driveshaft, inspect the yoke surface for burrs and damage. Mating surfaces should be clear of rust, contamination and grease.
2. With safety straps in place, align the phasing marks between the yoke and driveshaft.
3. Align the bearing cups in the yoke ears. A soft faced hammer can be used to fully seat the bearing cups into the yoke.
4. Install the bearing cap and bolts.

Lite 250, 350 Torque Specifications

Thread Size	Head Size*	Bolt Torque	
		N•m	Lb. Ft.
12 mm - 1.25	1/2" 12 point	250	185

5. Grease the U-joint and slip member after driveshaft installation. Refer to Lubrication section of this manual. Refer to Dana information bulletin **J3295** for grease specification guidelines.

Glossary

Balancing - A procedure by which the mass distribution of a rotating body is checked, and corrected to insure smooth operation.

Ball Yoke - See Tube Yoke.

Bearing Cross Hole - See Cross Hole.

Bearing Cup Assembly - Consists of a bearing up with needle rollers generally held in place by a seal guard and bearing seal. Sometimes the assembly includes a thrust washer.

Bearing Cup - A cup-shaped member used as the bearing bore of a bearing cup assembly and for positioning a thrust end of a cross trunnion.

Bearing Retainer - A heavy, formed metal cap used to retain a bearing cup assembly in Quick Disconnect end yoke or flange yoke designs.

Bearing Seal - A flexible member of a bearing cup assembly which prevents the escape of lubricant from or entry of foreign matter into a bearing.

Bearing Strap - Stamped metal strap used to retain a bearing cup assembly in a half-round end yoke or flange yoke design.

Boot - A flexible member which prevents the escape of lubricant from or entry of foreign matter into the slip spline members.

Boot Clamp - A thin adjustable band used to hold the boot in position on the slip spline members.

Boot Seal - See Boot.

Center Bearing - Consists of a rolling element bearing isolated in rubber and a bracket configuration for attachment to the vehicle fram.

Companion Flange - A fixed flange member that attaches the driveshaft assembly to another drivetrain component.

Coupling Shaft - The coupling member or members of a multiple-piece driveline which includes a center bearing.

Cross - See Journal Cross.

Cross Hole - A through hole in each lug ear of a yoke used to locate a bearing cup assembly.

Deflector - See Slinger.

Driveline - An assembly of one or more coupling shafts and a driveshaft with provisions for axial movement, which transmits torque and/or rotary motion at a fixed or varying angular relationship from one drivetrain component to another.

Driveshaft - An assembly of one or two universal joints connected to a tubular shaft member which accommodates axial movement.

Driveshaft Length (Center Line to Center Line or CL to CL) - The distance between the outermost universal joint centers on a driveshaft. On driveshafts with variable length centers, it is usually measured in the compressed or installed lengths.

Ear - One of two projecting parts of a yoke symmetrically located with respect to the yoke's rotational axis.

End Fitting - An end yoke or companion flange (including S.A.E., DIN and T-Type styles) that attaches a driveshaft to another drivetrain component.

End Yoke - A Quick Disconnect yoke that attaches a driveshaft to another drivetrain component.

Flange Yoke - A full-round or Quick Disconnect style yoke which attaches a driveshaft to a companion flange.

Glidecote - The blue, nylon, wear-resistant coating on Spicer yoke shafts and tube shafts.

Grease Zerk Fitting - The fitting on the shoulder or center of a journal cross or on a relubable slip spline that allows for lubrication.

Inboard Yokes - Yokes that make up the ends of a driveshaft or coupling shaft assembly, i.e. tube yokes, slip yokes, yoke shafts, and center bearing end yokes.

Installation Height Tools - Round, hard plastic disk that are supplied with all Spicer Life Series replacement universal joint kits to ensure proper bearing cup assembly installation specifications.

Journal Cross - The core component of a universal joint which is an intermediate drive member with four equally spaced trunnions in the same plane.

Lug Ear - See Ear.

Midship Shaft - A machined element consisting of spline teeth, a pilot for a center bearing and a piloting hub that attaches to the tube of a coupling shaft assembly.

Needle Rollers - One of the rolling elements of a bearing cup assembly.

Outboard Components - Yokes that are not a part of a driveshaft, i.e. transmission, axle, transfer case end yokes and/or companion flanges.

Phase Angle - The relative rotational position of each yoke on a driveshaft or driveline.

Pressure Relief Hole - A hole in the welch plug of Spicer slip yokes that allows air to escape from the slip member assembly.

Purge - The act of flushing old grease and contaminants from universal joint kits and slip member assemblies with fresh grease.

Quick Disconnect Cross Hole - A semicircular hole located on the end of each lug ear of some end yoke and flange yoke designs used to locate a bearing cup assembly.

Retaining Ring - See Snap Ring.

Retaining Ring Groove - See Snap Ring Groove.

Seal Can - A metal "can" that permanently seals the slip member on a driveshaft. Usually found on European-style driveshaft assemblies.

Seal Guard - A covering member used to protect a bearing seal on the bearing cup assembly.

Serrated Flange - See T-Flange

Shaft Length - Distance between the outermost universal joint center to joint center.

Shaft Support Bearing - See Center Bearing

Slinger - A stamped metal or non-metal ring which prevents the entry of foreign matter into a center bearing, transmission, axle or transfer case.

Slip - The total permissible length of axial travel.

Slip Yoke - A yoke which accomodates axial movement.

Slip Yoke Plug - See Welch Plug.

Slip Yoke Seal - Pop-on or threaded ring that contains a seal that protects the slip member assembly from environmental contaminants and retains lubricant.

Snap Ring - A removable member used as a shoulder to retain and position a bearing cup assembly in a yoke cross hole.

Snap Ring Groove - A groove used to locate a snap ring.

Spline - A machined element consisting of integral keys (spline teeth) or keyways (spaces) equally spaced around a circle or portion thereof.

Spline Sleeve - A tubular-type, machined element consisting of internal splines which is attached to a tube or tube yoke in a driveshaft assembly.

Spring Tab - A patented stamped metal plate that takes the place of a bearing plate and acts as a structural member by reducing looseness in a universal joint kit. Found only on Spicer Life Series driveshaft assemblies.

Stub Shaft - See Tube Shaft.

Tang - A nib of metal found on Quick Disconnect end yoke and/or flange yoke style cross holes, used to locate a bearing cup assembly.

T-Flange - A companion flange and flange yoke design which has a serrated flange face. Found most often in European applications.

T-Type Flange - See T-Flange.

Thrust Washer - A washer found in the bottom of a bearing cup assembly that reduces needle roller friction, bearing heat and guards against end galling on the journal cross trunnions.

Tubing - See Tube.

Tube O.D. (outside diameter) - The outside diameter of a tube.

Tube Yoke - An inboard yoke with a piloting hub for attachment to a tube or spline sleeve.

Tube Shaft - A machined element consisting of spline teeth and a piloting hub that attaches to the tube of a driveshaft assembly.

Trunnion(s) - Any of the four projecting journals of a cross.

Universal Joint - A mechanical device which can transmit torque and/or rotary motion from one shaft to another at fixed or varying angles of intersection of the shaft axes. Consisting of a journal cross, fitting and four bearing cup assemblies.

Universal Joint Kit - See Universal Joint.

U-Joint - Universal Joint with installation hardware.

Welch Plug - A plug in the slip yoke face that seals off one end of the spline opening. Also known as a slip yoke plug.

Weld Yoke - See Tube Yoke.

Yoke Lug Ear Cross Hole - See Cross Hole.

Yoke Shaft - A slip member yoke with a male machined spline used for axial movement.

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Dana Commercial Vehicle Products Group

3939 Technology Drive
Maumee, Ohio, USA 43537

www.dana.com/cv



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