SPICER®

DANA

Service Manual

Spicer® Hub

AXSM-0052

September 2007

The description and specifications contained in this service publication are current at the time of printing. Dana Corporation reserves the right to discontinue or modify its models and/or procedures and to change specifications at any time without notice.
Any reference to brand name in this publication is made as an example of the types of tools and materials recommended for use and should not be considered an endorsement. Equivalents 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.

⚠ **WARNINGS:** 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.

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.

Every effort has been made to ensure the accuracy of all information in this guide. **However, Spicer Axle and Brake Division makes no expressed or implied warranty or representation based on the enclosed information.**

Any errors or omissions may be reported to:
Marketing Services, Dana Corporation, PO Box 321, Toledo, Ohio 43697-0321

Contents

Changing oil

Note: New and reconditioned axles are greased where necessary, but are not filled with oil when then leave the manufacturing facility.

Drain and refill oil on new units after the first month or 100 hours while axle is still warm, then at intervals of 1,000 hours or 6 months.

Oil Level

Check oil levels monthly or every 100 hours following the procedure below.

1. Vehicle must be on level ground.

2. Remove differential oil filter plug and check oil level. Add oil if necessary.

⚠ Warning: Never work under a vehicle supported by only a jack. Always support vehicle with stands. Block the wheels and make sure the vehicle will not roll before releasing the brakes.

Note: Spicer recommends cleaning the magnetic filler plug, drain plugs, and cleaning the breather.

Note: There is no oil sealing between the drive head and hubs. Drive head and Hub oil levels should be on the axle center line. When refilling add amounts shown below to hubs then drive head and let sit in axle for 15 minutes before checking levels at all points. Add oil as necessary until level after settling period.

Always check final oil level at drive head.

3. Raise the wheels off the ground and support with proper stands.

4. Rotate each hub so the bottom of the hub filler/level plugs are on the axle center line (level with the differential filler plug).

5. Unscrew the plugs and check that oil level is at the bottom of plug holes. If not, add oil to each hub through plug holes then check level in drive head.

6. When level is correct, refit and tighten all filler/level plugs.

Approximate capacities:

HS 415 SM - 6 pints (3.5 liters) per hub.
HS 515 SP - 8 pints (4.5 liters) per hub.
HP 519 SP - 8 pints (4.5 liters) per hub.
HS 716 SQ - 8 pints (4.5 liters) per hub.
HD 719 SQ - 8 pints (4.5 liters) per hub.

Recommended oil MIL-L-2105D.

Service Instructions For HS415SM Model

Description

The hub gears are driven by a floating sun pinion which is splined to a drive shaft. The gear meets with three planet gears mounted in a carrier which is bolted to the hub. The ring gear is two pieces splined to the axle spindle, it also serves to support the outer hub bearing cone. The hub is fully floating, running on a taper roller bearing which is secured and adjusted by a nut locking ring.

The unit is mounted on a removable spindle, bolted to the axle housing.

Routine Maintenance

Service the vehicle every six months, checking the following:

1. General condition of nuts, bolts and housing
2. Joints and seals for signs of leakage.

Tooling/Sealant List

Spring balance to read to 25 lbs. (12kg).
Hub nut spanner - E537.
Assembly tooling - E539.
Hub oil seal fitting tool - E540.
Loctite No. 277 locking compound.
Loctite No. 515 liquid gasket.
Loctite No. 609 sealing compound.

⚠ Caution: Viton O-rings and seals (flouro-elastomers) - safety hazards.
Viton material used in oil seals and O-rings produces a highly corrosive acid (hydroflouric) when subjected to temperatures above 315° C. This acid is very toxic and should not be come in contact with. We recommend the following procedure when it is necessary to inspect any equipment that has been subjected to high temperature or fire.

a. Visually inspect any gaskets or seals that have suffered from heat; they will appear black and sticky.

b. If this condition exists, do not handle.

c. Confirm material composition. Any flouroelestomer (Viton, Flourel or Tecomoflon) should be considered dangerous but natural rubber and nitrile are nonhazardous.

d. If flouroelastomer seals have been used, the affected area must be decontaminated before continuing.

e. Disposable heavy duty gloves must be worn and the affected area decontaminated by washing thoroughly with limewater (calcium hydroxide solution).

f. Discard any clothing contaminated after use.

Note: Burning of discarded items is NOT RECOMMENDED, except in an approved incineration process where gaseous products are treated by alkaline scrubbing.

Removal of hub on vehicle

Note: Clean all parts in suitable cleaning agent.

Draining the oil

- Before attempting to remove road wheels, drive vehicle onto a level surface. Drain when lube is at normal operating temperature.
- Block the wheels and make sure the vehicle will not roll.
- Loosen but do not remove wheel nuts when wheels are still on the ground.
- Raise axle and support with suitable stands.
- Remove wheel nuts and washers.
- Remove wheels.

Note: As there is no oil sealing between drive heads and hubs, oil must be drained from all three units before overhaul.

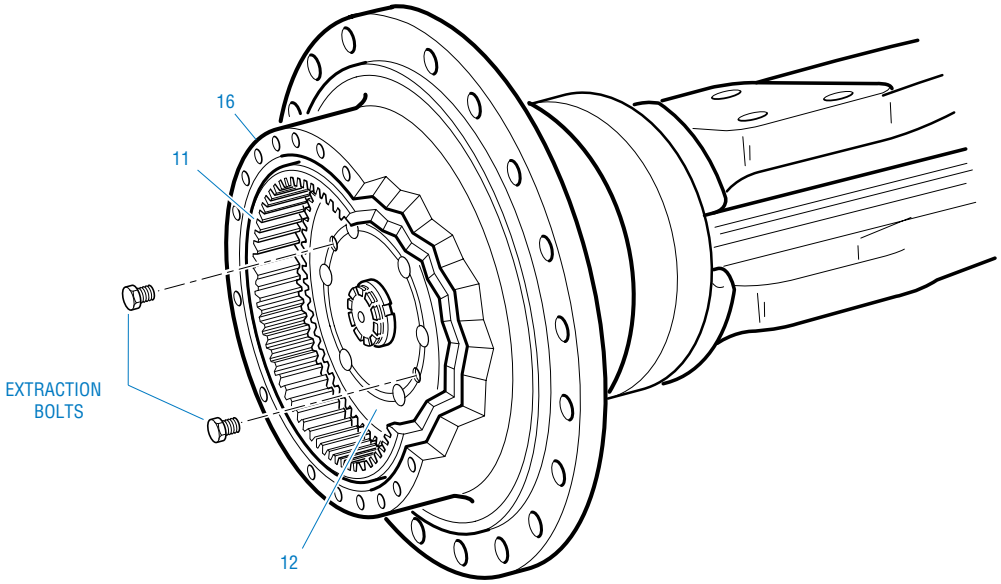
- Place containers under differential and both hubs.
- Remove differential oil filler plug and drain bolt and oil from differential.
- Rotate hubs to bring carrier drain setscrews to their lowest point.
- Remove hub filler/level plug.
- Remove drain setscrews and washers to drain oil from hubs.
- When oil in completely drained, remove drip tray and support hub adequately.
- Replace drain setscrews and washers and hub filler/level plug.
- Replace differential drain bolt.

Disassemble Planet Carrier Unit

- Unscrew and remove carrier capscrews and washers.
- Using chain hoist, carefully remove planet carrier assembly from axle. Place on bench or press and support in an upright position with outboard end of carrier facing down. Remove planet pin by first removing set screw and then press pin down (outboard) and out of carrier.
- Carefully remove planet gear.
- Repeat operations for other planet gear assemblies.
- Remove and discard O-rings from planet pins.
- If thrust button needs changing, pull out of its position in planet carrier inner face.
- Remove sealing compound from planet carrier and hub mating faces using Loctite Chisel Gasket Remover or by carefully scraping sealant from faces.

Disassembling Planetary Ring Gear Unit

- Pull out axle shaft complete with sun gear, snap ring and washer from axle spindle.
- Remove snap ring from groove in axle shaft then pull off sun gear and thrust washer.
- Remove lockrings and hub retaining nut from axle spindle.
- Insert extraction bolts into holes provided in ring gear and tighten evenly to pull ring gear assembly, complete with outer hub bearing cone from axle spindle.
- Remove retraining ring then separate ring gear from ring gear carrier.
- Remove outer hub bearing cone from its position on ring gear carrier if required.



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Removing Hub Unit

- Using suitable support, carefully remove hub assembly from axle spindle and place on work bench, outer end down.
- Carefully remove oil seal outer half from hub then lift inner hub bearing cone.
- Inspect oil seal part for wear and damage.
- Check hub bearing cups for wear and damage. If necessary, remove cups from hub using soft metal drift pin.

Note: If either bearing cup or cone needs replacing, a new cup and cone must be fitted.

- Inspect oil seal half parts and housing for wear and damage.

Note: If any seal assembly parts need to be replaced, a complete new assembly must be fitted.

- Inspect condition of hub spacer, removing for replacement if required.

Hub/Axle Stub subassembly

- Heat oil seal housing until hand hot (120° C, 248°F max.), then push into position on axle stub.
- When oil seal housing has cooled, push bearing spacer into position on axle stub.
- Fill bearing cone with grease using a bearing packer or manually kneading grease between rollers, race and cage, then push into position on axle stub.
- Fit inner and outer hub bearing cups into position on hub.

Assembly

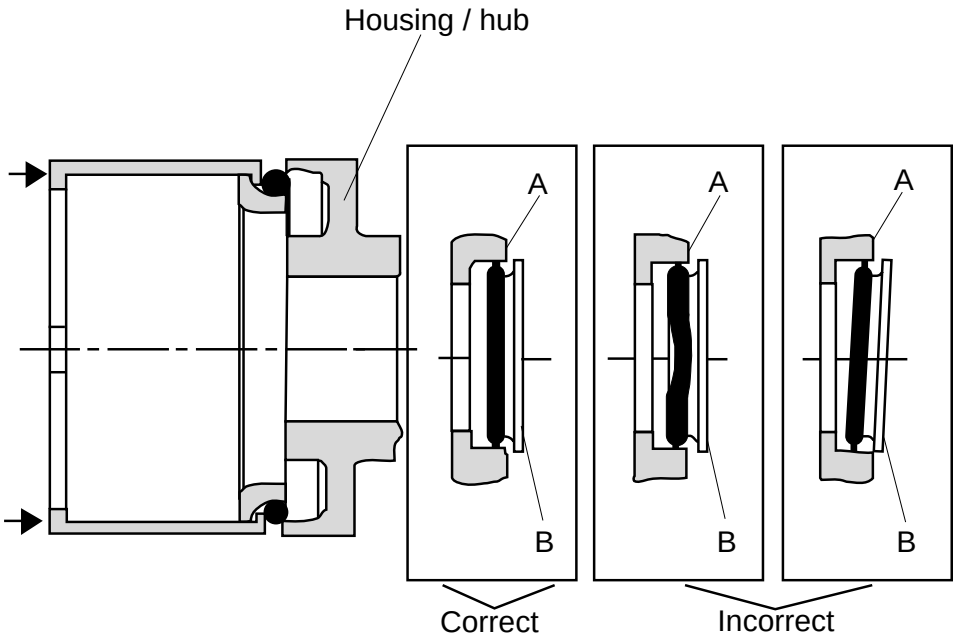
- Remove hub oil seal assembly from package, fit one half into hub and other into inner seal housing as follows:

  a. Do not remove seals from package until immediately before installation. This protects the super-finished seal faces from damage and contamination.
  b. Hub and oil seal housing must be clean.
  c. Install face seal by means of special fitting tool number E541. Pressure is applied directly via the elastromeric part. For ease of assembly moisten the bore and O-rings with a water/spirit mixture (NOT OIL).
  d. Press seal ring into hub/ seal housing using even pressure on opposite sides of tool. Ensure that the housing/hub surface 'A' lies parallel to the seal face 'B'. The O-rings must not be pinched in the hub/housing or partially out of the bore.

- Assemble ring gear and ring gear carrier together and secure with ring gear retainer.
- Press hub outer bearing cone onto ring gear carrier journal.
- Clean metal surfaces with a lint free cloth, apply a thin film of clean oil to metal faces.

Note: Keep oil off of other surfaces.

- Support hub with chain hoist, and carefully push into position on axle spindle.
- Assemble guide tube from assembly tooling E 539 onto axle spindle, carefully pushing into position on axle spindle. Use bumper or soft metal hammer from assembly tooling to ensure ring gear is driven on completely.
- Fit hub bearing nut and tighten hand tight.
- Remove chain hoist.



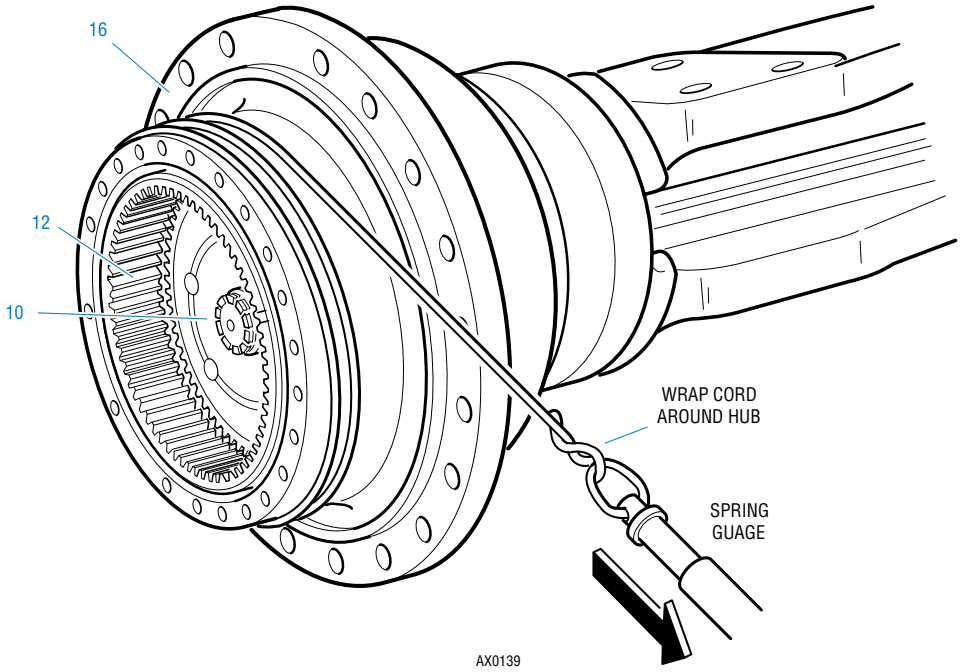
Hub Bearing Setting

- Torque hub nut to 190-210 lbs. ft. (258-285 N•m).

Note: The hub should be fully rotated several times in both directions to ensure the hub bearings are correctly seated.

- Secure a cord to a wheel stud and wrap cord around hub, fasten free end to a spring balance.
- Apply a steady pull to spring balance and note reading, ignoring the large force initially required to start rotation.
- The correct spring balance reading should be between 6 to 10 lbs. (2.7 to 4.5 kg) corresponding to a hub rolling torque of 3-5 lbs. ft. (4-7 N•m).
- If spring balance reading is outside limits stated, adjust hub nut and check again, continuing until correct figure is obtained.
- When hub setting is correct, fit lockrings, then retaining ring.

Note: To align slots in nut with corresponding slots in axle spindle, do not back off. Continue to tighten nut until slots are aligned.



Sub Assembly - Planet Carrier Unit

- Place planet carrier with large diameter face up with planet gear access hole facing the mechanic.
- Smear clean grease into bore of one planet gear.
- Insert planet gear and thrust washers into planet carrier.
- Lightly oil O-ring and O-ring grove in planet pin with clear gear oil then fit O-ring into planet carrier.
- Insert planet pin, O-ring up into planet carrier and through planet gear making sure to line up flat on planet pin with hole in planet carrier for set screw.
- Clean set screw threads with solvent then apply Loctite 275. Drive screw into hole in planet carrier and tighten to a torque of 22-27 lbs. ft. (30-36 N•m) to secure planet pin assembly.
- Repeat operations for other two planet gear assemblies.
- Stake screw in four places to lock in position.
- Coat thrust button bore, in planet carrier, with Loctite 275 then fit thrust button.

Fitting Planet Carrier Unit/Final Assembly

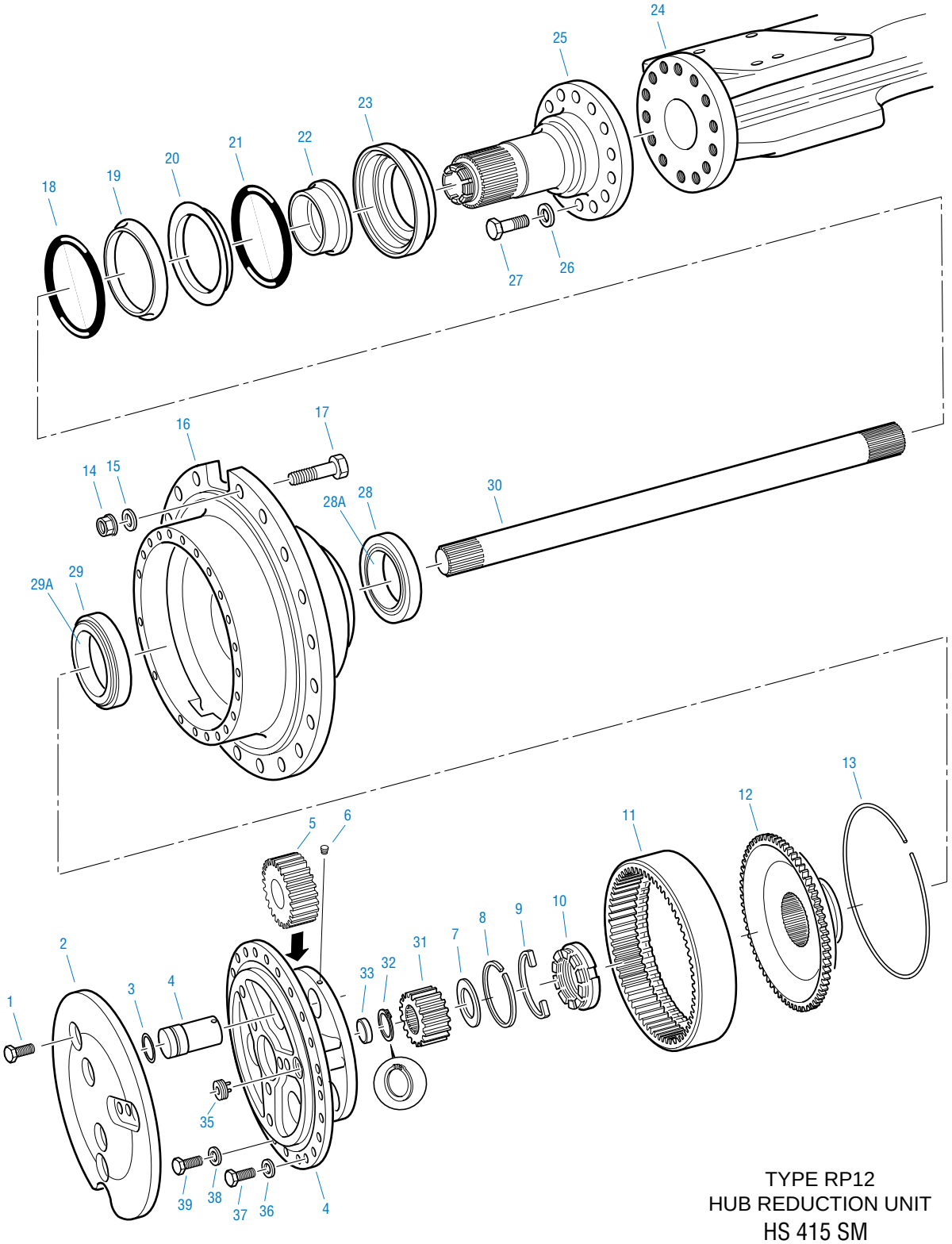
- Fit thrust washer, then sun gear onto axle shaft, then fit snap ring to secure.
- Apply clean gear oil to axle shaft inner splines. Insert axle shaft assembly into axle spindle until axle shaft splines are engaging with differential gear splines.
- Coat hub mating face of planet carrier with Loctite 515 joining planet carrier unit with hub using chain hoist if required. Ensure planet gear teeth mesh with sun gear.
- Fit planet carrier capscrews and hardened washers, tighten to a torque of 91-101 lbs. ft. (123-137 N•m).
- Fit drain capscrew and washer, tighten to a torque of 145-161 lbs. ft. (196-218 N•m).
- Fit planet cover plate, secure with capscrew, tightening to 66-72 lbs. ft. (89-98 N•m).
- Rotate both hubs until oil filler/level plug holes are on axle center line, fill with oil until level with bottom of level hole thread.
- Fill drive head with oil.
- Allow oil to settle for 15 minutes, then check oil level again in both hubs and differential.
- Refit then tighten the filler/level plug then drive head filler plug.
- Refit road wheels securing with spherical washers and wheel nuts. Remove supports and lower vehicle to ground. Tighten wheel nuts to a torque of 400-430 lbs. ft. (542-583 N•m).

Note: The wheel nuts should be checked and tightened if necessary, shortly after initial operation.

Tightening Torque Table

For Type HS 415 SM Hub

Item No.	Description	Torque
1	Planet carrier cover capscrew	66-72 lbs. ft (89-98 N•m)
6	Planet carrier set screw	22-27 lbs. ft. (30-36 N•m)
10	Hub bearing retaining nut	190-210 lbs. ft. (258-285 N•m)
14	Wheel nuts	400-430 lbs. ft. (542-583 N•m)
27	Axle spindle retaining bolt	390-410 lbs. ft. (529-556 N•m)
37	Planet carrier capscrew	91-101 lbs. ft. (123-137 N•m)
39	Planet carrier drain capscrews	145-161 lbs. ft (196 - 218 N•m)



TYPE RP12
HUB REDUCTION UNIT
HS 415 SM

Service Instructions for HS515SP, HD519SP, HS716SQ, HD719SQ

Hub Reduction Units

Description

The hub gears are driven by a floating sun pinion which is splined to a drive shaft. The sun gear meets with three planet gears mounted to the carrier which is bolted to the hub. The ring gear is two pieces and splined to the axle spindle, it also supports the outer hub bearing cone. The hub is fully floating, running on taper roller bearings secured and adjusted by a nut with locking ring.
The unit is connected with a removable spindle bolted to the axle casing.

Routine Maintenance

Service vehicle every 6 months, check the following:

1. General condition of nuts, bolts and axle casing.
2. Joints / oil seals for signs of leakage.

Tooling/Sealant List

Spring balance to read 25 lbs. (12 kg.)
Outer bearing cone bumper - E534
Hub guide sleeve - E535
Ring gear carrier assembly tooling - E536
Hub nut spanner - E538
Hub oil seal fitting tool - E541
Loctite No. 277 locking compound
Loctite No. 515 liquid gasket
Loctite No. 609 sealing compound

Vision O-rings and seals (flour-elastomers) - safety hazards

Caution: Viton O-rings and seals (flouro-elastomers) - safety hazards. Viton material used in oil seals and O-rings produces a highly corrosive acid (hydroflouric) when subjected to temperatures above 315° C. This acid is very toxic and should not be come in contact with. We recommend the following procedure when it is necessary to inspect any equipment that has been subjected to high temperature or fire.

a. Visually inspect any gaskets or seals that have suffered from heat; they will appear black and sticky.
b. If this condition exists, do not handle.
c. Confirm material composition. Any flouro-elestomer (Viton, Flourel or Tecomoflon) should be considered dangerous but natural rubber and nitrile are nonhazardous.
d. If flouroelastomer seals have been used, the affected area must be decontaminated before continuing.
e. Disposable heavy duty gloves must be worn and the affected area decontaminated by washing thoroughly with limewater (calcium hydroxide solution).
f. Discard any clothing contaminated after use.

Note: Burning of discarded items is NOT RECOMMENDED, except in an approved incineration process where gaseous products are treated by alkaline scrubbing.

Removal of hub on vehicle

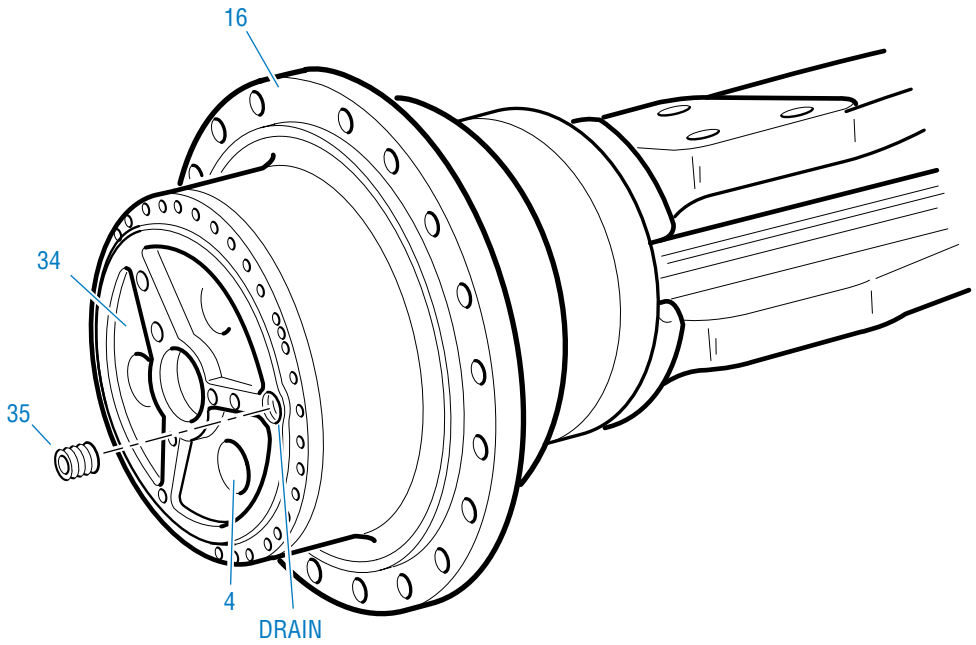
Note: Clean all parts in suitable cleaning agent.

Draining the oil

- Before attempting to remove road wheels, drive vehicle onto a level surface. Drain when lube is at normal operating temperature.
- Block the wheels and make sure the vehicle will not roll.
- Loosen but do not remove wheel nuts when wheels are still on the ground.
- Raise axle and support with suitable stands.
- Remove wheel nuts and washers.
- Remove wheels.

Note: As there is no oil sealing between drive heads and hubs, oil must be drained from all three units before overhaul.

- Place containers under diff. and both hubs.
- Remove diff. oil filler plug and drain bolt and oil from diff.
- Rotate hubs to bring carrier drain setscrews to their lowest point.
- Remove hub filler/level plug.
- Remove drain setscrews and washers to drain oil from hubs.
- When oil in completely drained, remove drip tray and support hub adequately.
- Replace drain setscrews and washers and hub filler/level plug.
- Replace diff. drain bolt.



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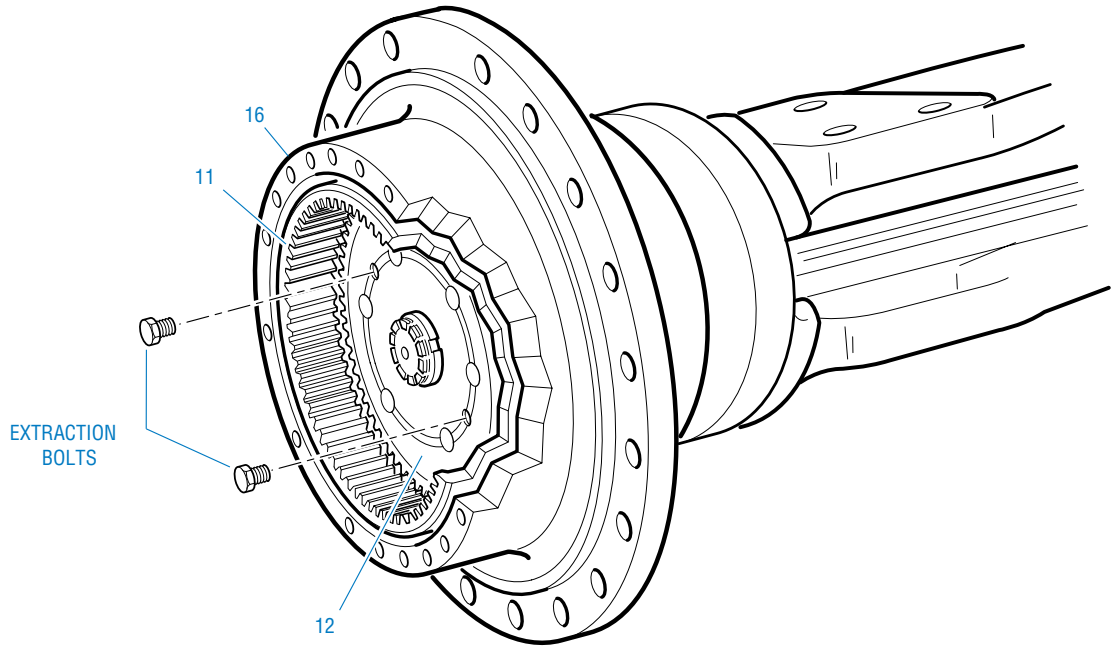
Disassemble Planet Carrier Unit

- Unscrew and remove carrier capscrews and washers.
- Using chain hoist, carefully remove planet carrier assembly from axle. Place on bench or press and support in an upright position with outboard end of carrier facing down. Remove planet pin by first removing set screw and then press pin down (outboard) and out of carrier.
- Carefully remove planet gear.
- Repeat operations for other planet gear assemblies.
- Remove and discard O-rings from planet pins.
- If thrust button needs changing, pull out of its position in planet carrier inner face.
- Remove sealing compound from planet carrier and hub mating faces using Loctite Chisel Gasket Remover or by carefully scraping sealant from faces.

Disassembling Planetary Ring Gear Unit

- Pull out axle shaft complete with sun gear, snap ring and washer from axle spindle.
- Remove snap ring from groove in axle shaft then pull off sun gear and thrust washer.
- Remove lockrings and hub retaining nut from axle spindle.
- Insert extraction bolts into holes provided in annulus and tighten evenly to pull ring gear assembly, complete with outer hub bearing cone from axle spindle.
- Remove retraining ring then separate ring gear from ring gear carrier.
- Remove outer hub bearing cone from its position on ring gear carrier if required.



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Removing Hub Unit

- Using suitable support, carefully remove hub assembly from axle spindle and place on work bench, outer end down.
- Carefully remove oil seal outer half from hub then lift inner hub bearing cone.
- Inspect oil seal part for wear and damage.
- Check hub bearing cups for wear and damage. If necessary, remove cups from hub using soft metal drift pin.

Note: If either bearing cup or cone needs replacing, a new cup and cone must be fitted.

- Inspect oil seal half parts and housing for wear and damage.

Note: If any seal assembly parts need to be replaced, a complete new assembly must be fitted.

- Inspect condition of hub spacer, removing for replacement if required.

Hub/Axle Stub subassembly

- Heat oil seal housing until hand hot (120° C, 248°F max.), then push into position on axle stub.
- When oil seal housing has cooled, push bearing spacer into position on axle stub.
- Fill bearing cone with grease using a bearing packer or manually kneading grease between rollers, race and cage, then push into position on axle stub.
- Fit inner and outer hub bearing cups into position on hub.

Assembly

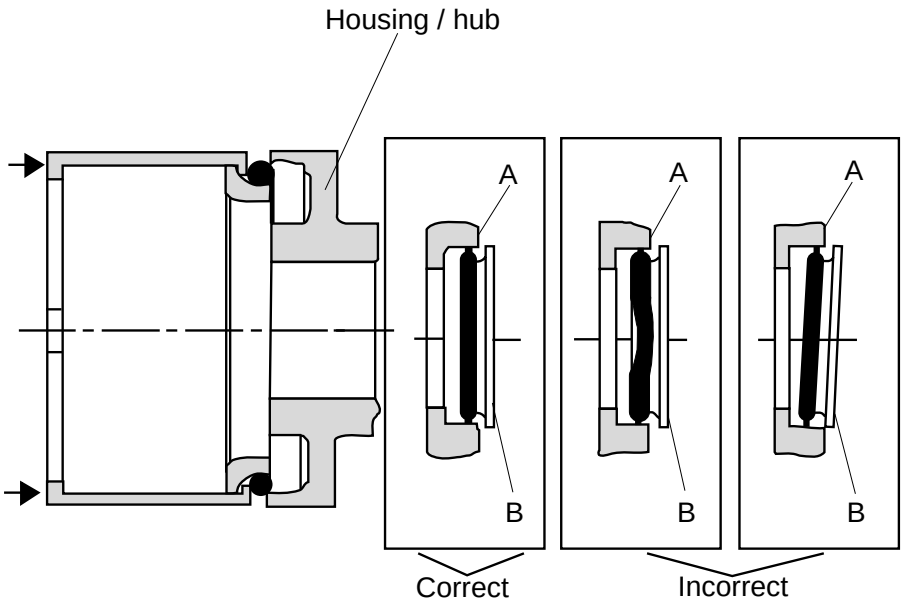
- Remove hub oil seal assembly from package, fit one half into hub and other into inner seal housing as follows:

  a. Do not remove seals from package until immediately before installation. This protects the super-finished seal faces from damage and contamination.
  b. Hub and oil seal housing must be clean.
  c. Install face seal by means of special fitting tool number E541. Pressure is applied directly via the elastromeric part. For ease of assembly moisten the bore and O-rings with a water/spirit mixture (NOT OIL).
  d. Press seal ring into hub/ seal housing using even pressure on opposite sides of tool. Ensure that the housing/hub surface 'A' lies parallel to the seal face 'B'. The O-rings must not be pinched in the hub/housing or partially out of the bore.

- Assemble ring gear and ring gear carrier together and secure with ring gear retainer.
- Press hub outer bearing cone onto ring gear carrier journal.
- Clean metal surfaces with a lint free cloth, apply a thin film of clean oil to metal faces.

Note: Keep oil off of other surfaces.

- Support hub with chain hoist, and carefully push into position on axle spindle.
- Assemble guide tube from assembly tooling E 539 onto axle spindle, carefully pushing into position on axle spindle. Use bumper or soft metal hammer from assembly tooling to ensure annulus is driven on completely.
- Fit hub bearing nut and tighten hand tight.
- Remove chain hoist.



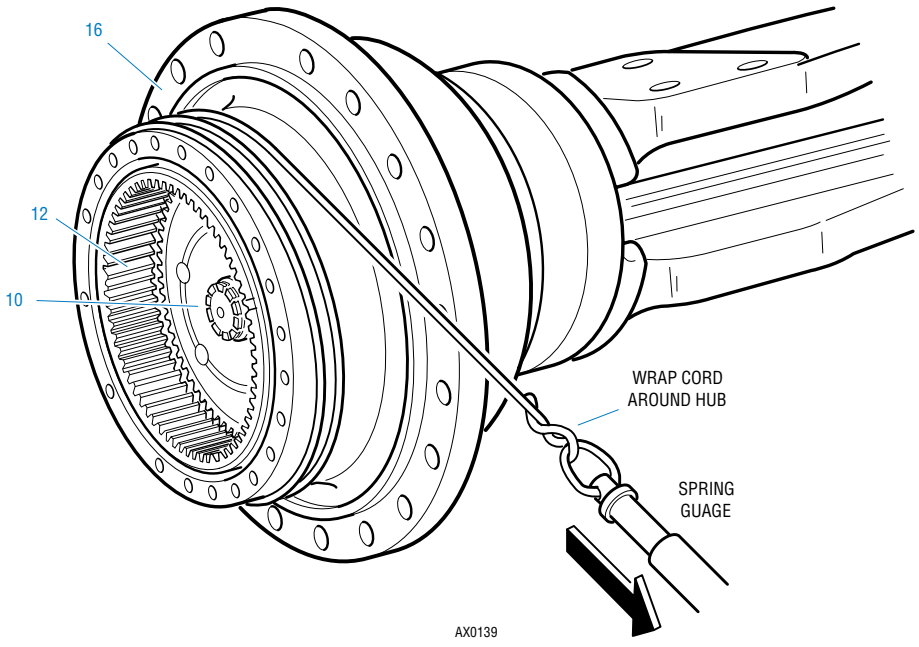
Hub Bearing Setting

- Torque hub nut to 238-263 lbs. ft. (323-357 N•m).

Note: The hub should be fully rotated several times in both directions to ensure the hub bearings are correctly seated.

- Secure a cord to a wheel stud and wrap cord around hub, fasten free end to a spring balance.
- Apply a steady pull to spring balance and note reading, ignoring the large force initially required to start rotation.
- The correct spring balance reading should be between 8.5 to 12 lbs. (3.8 to 5.4 kg) corresponding to a hub rolling torque of 7-9 lbs. ft. (9-12 N•m).
- If spring balance reading is outside limits stated, adjust hub nut and check again, continuing until correct figure is obtained.
- When hub setting is correct, fit lockrings, then retaining ring.

Note: To align slots in nut with corresponding slots in axle spindle, do not back off. Continue to tighten nut until slots are aligned.



Sub Assembly - Planet Carrier Unit

- Place planet carrier with large diameter face up with planet gear access hole facing the mechanic.
- Smear clean grease into bore of one planet gear.
- Insert planet gear and thrust washer into planet carrier.
- Lightly oil O-ring and O-ring grove in planet pin with clear gear oil then fit 'O'ring into planet pin.
- Insert planet pin, O-ring up into planet carrier and through planet gear making sure to line up flat on planet pin with hole in planet carrier for set screw.
- Clean set screw threads with solvent then apply Loctite 275. Drive screw into hole in planet carrier and tighten to a torque of 22-27 lbs. ft. (30-36 N•m) to secure planet pin assembly.
- Repeat operations for other two planet gear assemblies.
- Stake screw in four places to lock in position.
- Coat thrust button bore, in planet carrier, with Loctite 275 then fit thrust button.

Fitting Planet Carrier Unit/Final Assembly

- Fit thrust washer, then sun gear onto axle shaft, then fit snap ring to secure.
- Apply clean gear oil to axle shaft inner splines. Insert axle shaft assembly into axle spindle until axle shaft splines are engaging with differential gear splines.
- Coat hub mating face of planet carrier with Loctite 515 joining planet carrier unit with hub using chain hoist if required. Ensure planet gear teeth mesh with sun gear.
- Fit planet carrier capscrews and hardened washers, tighten to a torque of 91-101 lbs. ft. (123-137 N•m).
- Fit drain capscrew and washer, tighten to a torque of 145-161 lbs. ft. (196-218 N•m).
- Fit planet cover plate, secure with capscrew, tightening to 66-72 lbs. ft. (89-98 N•m).
- Rotate both hubs until oil filler/level plug holes are on axle center line, fill with oil until level with bottom of level hole thread.
- Fill drive head with oil.
- Allow oil to settle for 15 minutes, then check oil level again in both hubs and diff.
- Refit then tighten the filler/level plug then drive head filler plug.
- Refit road wheels securing with spherical washers and wheel nuts. Remove supports and lower vehicle to ground. Tighten wheel nuts to a torque of 400-430 lbs. ft. (542-583 N•m).

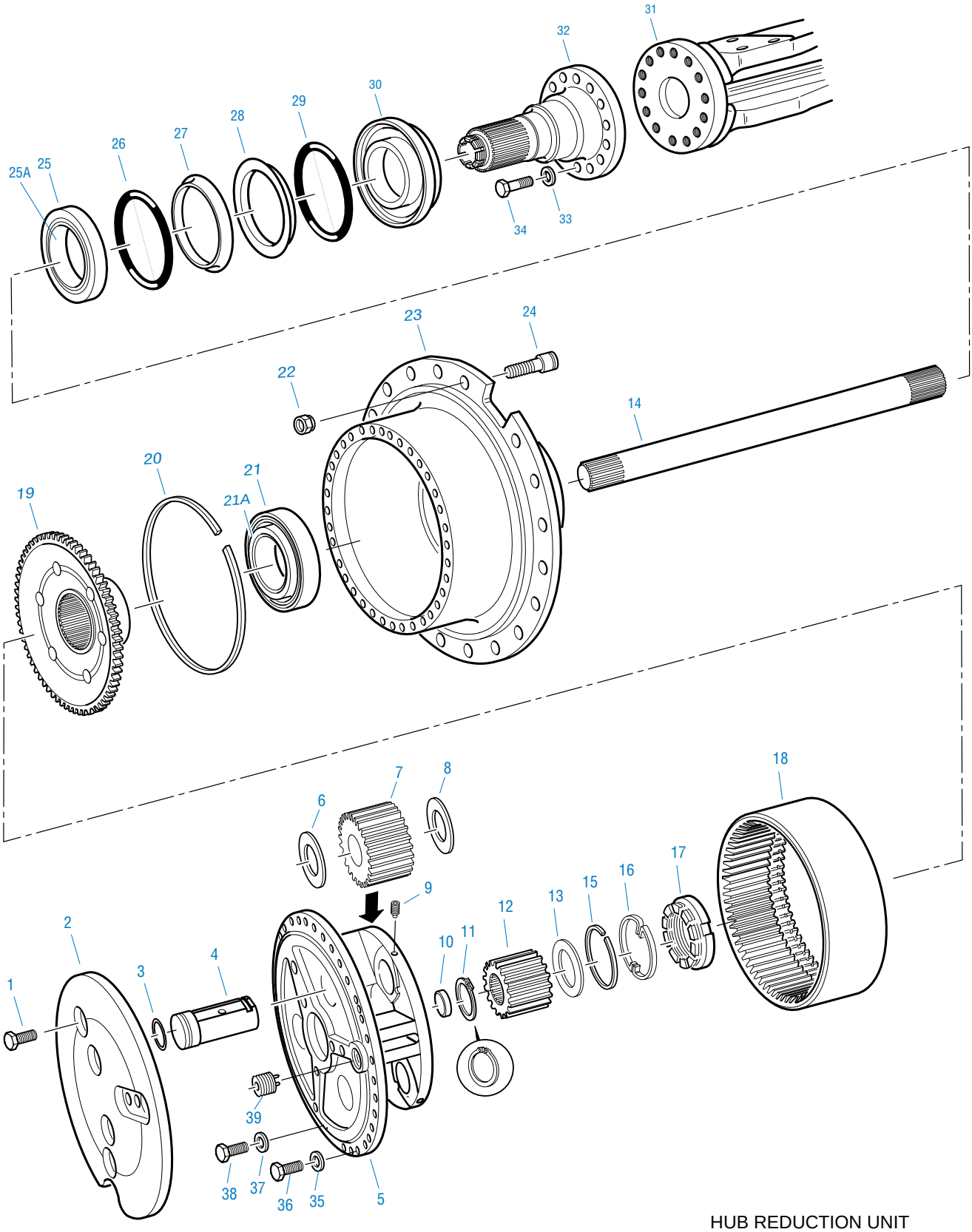
Note: The wheel nuts should be checked and tightened if necessary, shortly after initial operation.

Tightening Torque Table for Type

HS 515 SP, HD 519 SP,

HS 716 SQ, HD 719 SQ

Item No.	Description	Torque
1	Planet carrier cover capscrew	66-71 lbs. ft. (89-98 N•m)
9	Planet carrier set screw	22-27 lbs. ft. (30-36 N•m)
17	Hub bearing retaining nut	238-263 lbs. ft. (323-357 N•m)
22	Wheel nuts	400-420 lbs. ft. (542-583 N•m)
34	Axle spindle retaining bolt	390-410 lbs. ft. (529-556 N•m)
38	Planet carrier capscrew	91-101 lbs. ft. (123-137 N•m)
39	Planet carrier drain capscrews	145-151 lbs. ft. (196-218 N•m)



HUB REDUCTION UNIT
HS 515 SP, HD 519 SP,
HS 716 SP, HD 719 SQ

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Parts List for HS515SP, HD519SP Hub Unit — Assembly No. 964464

Item No.	Description	Qty Per Axle	GKN Part No.	Spicer Part No.
1	Planet carrier cover capscrew	12	N70134	965201
2	Planet carrier cover	2	R9902/29	96557
3	'O' ring	6	N60410	965167
4	Planet pin	6	R9611/42	965707
5	Planet carrier	2	R9899/39	965717
6	Planet pin thrust washer	6	N40457	964989
7	Planet gear	6	R9611/37	965705
8	Planet pin thrust washer	6	N40457	964989
9	Planet pin retainer setscrew	6	N70090	963972
10	Thrust button	2	N40450	963935
11	Sun gear snap ring	2	N60017	965142
12	Sun gear	2	R9611/38	965706
13	Sun gear thrust washer	2	N40741	965011
14	Drive shaft	2	R9899/46A	965718
15	Hub nut snap ring	2	N60332	965161
16	Hub nut lock ring	4	N40998	965022
17	Hub nut	2	N40995	965021
18	Ring gear	2	R9611/36	965704
19	Ring gear carrier	2	R9611/9	965708
20	Ring gear snap ring	2	N40458	964990
21	Bearing cup (outer)	2	SL289/389	965724
21A	Bearing cone (outer)	2	SL289/390	965725
22	Wheel nut (supplied by customer)	38		
23	Hub	2	R9899/114	965715
24	Wheel stud	38	R9893/137	965756
25	Bearing cup (inner)	2	SL320/57	027816
25QA	Bearing cone (inner)	2	SL320/58	965727
26 to 29	Hub oil seal assembly	2	SR9899/187	965729
30	Oil seal retainer	2	R9899/81	965719
31	Axle housing assembly	1	R9893/240	965666
32	Spindle	2	R9899/238	965716
33	Axle spindle washer	28	N70040	963970
34	Spindle bolt	28	N70005	965176
35	Planet carrier washer	46	SL238/5	964281
35	Spindle bolt	14	N70006	
36	Planet carrier capscrew	46	N70196	963977
37	Oil drain washer	2	N70200	963978
38	Oil drain capscrew	2	N70137	963974
39	Level plug	2	N70042	963971

Assy. No. 964463

Axle Assembly No. 964463 is same as 964464 except for the following parts:

14	Axle shaft RH	1	R9908/46A
	Axle shaft LH (lock side)	1	R9902/46A
31	Axle Housing	1	R9899/240

Also required, but not illustrated:

Assembly no. 964464

	Axle housing stud	4	R9893/184
	Axle housing nut	4	SL221/5
	Axle housing capscrew	8	R9390/90
	Axle housing washer	12	SL242/5
	Filler/level & drain plug	2	R9893/22
	Filler/level & drain plug 'O' ring	2	R9893/149

Assembly no. 964463

	Axle housing stud	4	R9896/184
	Axle housing nut	4	R9899/68
	Axle housing setscrew	8	ML6016/40X
	Axle housing washer	12	ML5716/1
	Filler/level & drain plug	2	R9893/22
	Filler/level & drain plug 'O' ring	2	R9893/149

Parts List For HS716SQ Hub Unit Assembly No. 964465

1	Planet carrier cover capscrew	12	N70134
2	Planet carrier cover	2	R9902/29
3	'O' ring	6	N60410
4	Planet pin	6	N40506
5	Planet carrier	2	N40723
6	Planet pin thrust washer	6	N50200
7	Planet gear	6	N50200
8	Planet pin thrust washer	6	N40457
9	Planet pin retainer set screw	6	N70090
10	Thrust button	2	N40450
11	Sun gear snap ring	2	N60099
12	Sun gear	2	N50203
13	Sun gear thrust washer	2	N40891
14	Axle shaft LH-(lock side)	1	R9905/4A
	Axle shaft RH	1	R9896/46A
15	Hub nut snap ring	2	N60332
16	Hub nut lock ring	4	N40998
17	Hub nut	2	N40995
18	Ring gear	2	N50201
19	Ring gear carrier	2	R9611/9
20	Ring gear snap ring	2	N40458
21	Bearing cup (outer)	2	SL289/389
21A	Bearing cone (outer)	2	SL289/390
22	Wheel nut (supplied by customer)		
23	Hub	2	R9896/114
24	Wheel stud	38	R9893/137
25	Bearing cup (inner)	2	SL289/247
25A	Bearing cone (inner)	2	SL289/180
26 to 29	Hub oil seal assembly	2	SR9899/187
30	Oil seal retainer	2	R9899/81
31	Axle housing assembly	1	R9896/240
32	Spindle	2	R9899/238
33	Axle spindle washer	28	N70040
34	Spindle bolt	28	N70005
35	Planet carrier washer	46	SL238/5
35	Stub bolt	14	N70006
36	Planet carrier capscrew	46	N70196
37	Oil drain washer	2	N70200
38	drain capscrew	2	N70137
39	Level plug	2	N70042

Axle Assy. No. 964466

Hub assembly no. 964466 is same as 964465 except for following parts:

14	Axle shaft	2	R9911/46A
31	Axle housing	1	R9911/240

Hub assembly No. 964467 is same as 964465 except for the following parts:

14	Axle shaft RH	1	R9896/46B
	Axle shaft LH (lock side)	1	R9905/46B
31	Axle housing	1	R9905/240

Assembly no. 964465 & 964467

Axle housing stud	4	R9896/184
Axle housing nut	4	R9899/68
Axle housing capscrew	8	ML6016/40X
Axle housing washer	12	ML5712/1
Filler/level & drain plug	2	R9893/22
Filler/level & drain plug O-ring	2	R9893/149

Assembly no. 964466

Axle housing stud	4	R9911/184
Axle housing nut	4	R9911/68
Axle housing capscrew	8	R9911/90
Axle housing washer	12	ML5712/1
Filler/level & drain plug	2	R9893/22
Filler/level & drain plug O-ring	2	R9893/149

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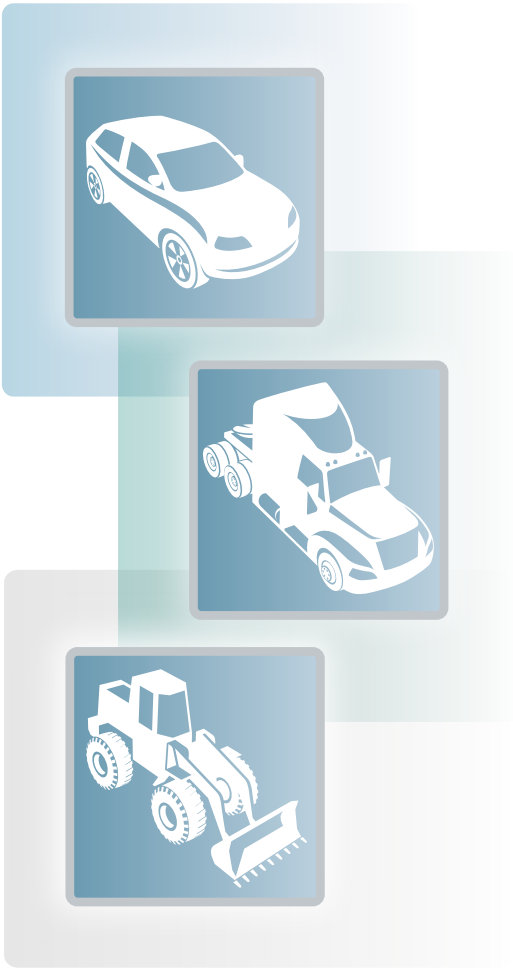

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