NOSE GEAR

1. DESCRIPTION

The nose gear consists of a tubular steel strut attached to the engine mount.

Serials 1005 thru 1885 before SB 2X-32-18: The free castering nosewheel’s maximum turning arc is 216 degrees (108 degrees either side of center).

Serials 1886 & subs, Serials 1005 thru 1885 after SB 2X-32-18: The free castering nosewheel’s maximum turning arc is 170 degrees (85 degrees either side of center).

Serials 1005 thru 2064: Shock absorption is provided by a series of stacked, polymer pucks which react against the engine mount.

Serials 2065 & subs: Shock absorption is provided by a nitrogen and hydraulic fluid filled oleo-pneumatic oleo strut in which compression of a piston rod reacts against the engine mount.

Steering is accomplished by differential application of the main gear brakes. The wheel, axle, tire, tube (Serials 1005 thru 2240 before SB2X-32-21), wheel bearing, and seal are mounted on the nose gear.
## 2. TROUBLESHOOTING

<table>
<thead>
<tr>
<th>TROUBLE</th>
<th>PROBABLE CAUSE</th>
<th>REMEDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excessive tire wear.</td>
<td>Main gear out of alignment.</td>
<td>Align main gear. (Refer to 32-10)</td>
</tr>
<tr>
<td></td>
<td>Nose wheel out of balance</td>
<td>Balance nose wheel and tire.</td>
</tr>
<tr>
<td></td>
<td>Incorrect tire pressure.</td>
<td>Inflate to proper pressure. (Refer to 12-10)</td>
</tr>
<tr>
<td></td>
<td>Nose gear assembly damaged.</td>
<td>Perform Inspection/Check - Nose Gear Assembly. (Refer to 32-20)</td>
</tr>
<tr>
<td>Nose wheel shimmy.</td>
<td>Nose wheel out of balance</td>
<td>Balance nose wheel and tire.</td>
</tr>
<tr>
<td></td>
<td>Loose, incorrectly tightened spindle nut.</td>
<td>Perform Adjustment/Test - Nose Wheel Fork Assembly. (Refer to 32-20)</td>
</tr>
<tr>
<td></td>
<td>Worn or incorrectly installed thrust washer.</td>
<td>Perform Inspection - Nose Wheel Fork Assembly. (Refer to 32-20)</td>
</tr>
<tr>
<td></td>
<td>Incorrect tire pressure.</td>
<td>Inflate to proper pressure. (Refer to 12-10)</td>
</tr>
<tr>
<td></td>
<td>Defective tire.</td>
<td>Replace tire.</td>
</tr>
<tr>
<td></td>
<td>Nose gear assembly damaged.</td>
<td>Perform Inspection/Check - Nose Gear Assembly. (Refer to 32-20)</td>
</tr>
<tr>
<td>Airplane leans forward.</td>
<td>Incorrect tire pressure.</td>
<td>Inflate to proper pressure. (Refer to 12-10)</td>
</tr>
<tr>
<td></td>
<td>Serials 2065 &amp; subs: Nitrogen pressure requires replenishment.</td>
<td>Replenish nitrogen per Servicing - Oleo Strut Fluid and Gas Replenishment. (Refer to 12-10)</td>
</tr>
<tr>
<td></td>
<td>Attaching parts loose, defective.</td>
<td>Tighten loose parts, replace.</td>
</tr>
<tr>
<td></td>
<td>Bent axles.</td>
<td>Replace with new parts.</td>
</tr>
<tr>
<td></td>
<td>Serials 1005 thru 2064: Polymer pucks damaged.</td>
<td>Inspect and replace with new parts.</td>
</tr>
<tr>
<td></td>
<td>Serials 2065 &amp; subs: Oleo strut damaged.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nose gear assembly damaged.</td>
<td>Perform Inspection/Check - Nose Gear Assembly. (Refer to 32-20)</td>
</tr>
<tr>
<td>Serials 2065 &amp; subs: Oleo Strut Fill Valve leakage.</td>
<td>Looseness of fill valve.</td>
<td>Tighten fill valve. If defective, replace sealing ring or fill valve and sealing ring, as required. (Refer to 32-20)</td>
</tr>
<tr>
<td>TROUBLE</td>
<td>PROBABLE CAUSE</td>
<td>REMEDY</td>
</tr>
<tr>
<td>---------</td>
<td>----------------</td>
<td>--------</td>
</tr>
<tr>
<td><strong>Serials 2065 &amp; subs: Leakage of hydraulic fluid on surface of piston rod.</strong></td>
<td>Damage to piston rod.</td>
<td>Perform Adjustment/Test - Oleo Strut. (Refer to 32-20)</td>
</tr>
<tr>
<td></td>
<td>Damage to internal sealing elements.</td>
<td>Replace oleo strut. (Refer to 32-20)</td>
</tr>
<tr>
<td><strong>Serials 2065 &amp; subs: Loss of hydraulic fluid.</strong></td>
<td>Damage to fill valve seal.</td>
<td>Perform Adjustment/Test - Oleo Strut. (Refer to 32-20)</td>
</tr>
<tr>
<td></td>
<td>Damage to piston rod.</td>
<td></td>
</tr>
<tr>
<td><strong>Serials 2065 &amp; subs: Exposed piston rod length is out-of-tolerance.</strong></td>
<td>Nitrogen pressure requires depletion or replenishment.</td>
<td>Measure nitrogen pressurization per Adjustment/Test - Oleo Strut. (Refer to 32-20)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Replenish nitrogen per Servicing - Oleo Strut Fluid and Gas Replenishment. (Refer to 12-10)</td>
</tr>
<tr>
<td></td>
<td>Increased friction of sealing elements due to low hydraulic fluid level.</td>
<td>Replenish fluid and nitrogen per Servicing - Oleo Strut Fluid and Gas Replenishment. (Refer to 12-10)</td>
</tr>
<tr>
<td><strong>Serials 2065 &amp; subs: While taxiing airplane, nose landing gear bounce is evident.</strong></td>
<td>Hydraulic fluid volume requires replenishment.</td>
<td>Replenish fluid and nitrogen per Servicing - Oleo Strut Fluid and Gas Replenishment. (Refer to 12-10)</td>
</tr>
</tbody>
</table>
3. MAINTENANCE PRACTICES

A. Nose Gear Fairing (See Figure 32-201)

1) Removal - Nose Gear Fairing

   (a) Serials 1005 thru 1885 before SB 2X-32-18: Turn nose wheel to full 108 degree deflection.
   (b) Serials 1886 & subs, Serials 1005 thru 1885 after SB 2X-32-18: Turn nose wheel to full 85 degree deflection.
   (c) Serials 1005 thru 2064: Cut and remove safety wire securing hinge pin to strut fairing and pull hinge pin from strut fairing.
   (d) Serials 1005 thru 2064: Remove screws securing strut fairing to nose strut and remove strut fairing from airplane.
   (e) Serials 2065 & subs: Remove screw securing U-nut to strut fairing. Pull hinge pin from strut fairing and remove strut fairing from airplane.
   (f) Remove towing lugs from nose wheel assembly.
   (g) Serials 1005 thru 1424, 1431 thru 1475: Remove wheel pant assembly.
      1. Remove screws securing upper access panel to forward wheel pant and remove upper access panel from airplane.
      2. Remove screws securing aft wheel pant to forward wheel pant and remove aft wheel pant.
      3. Remove screws securing forward wheel pant to nose wheel assembly and remove forward wheel pant from airplane.
   (h) Serials 1425 thru 1430, 1476 & subs: Remove wheel pant assembly.
      1. Remove screws securing forward wheel pant to aft wheel pant and remove forward wheel pant.
      2. Remove screws securing aft wheel pant to nose wheel assembly and remove aft wheel pant from airplane.

2) Disassembly - Nose Gear Fairing - Serials 2065 & subs

   (a) Acquire necessary tools, equipment, and supplies.
   (b) Remove seal from strut fairing.
   (c) Remove residue from installation areas using scraper and isopropyl alcohol. (Refer to 20-30)

3) Assembly - Nose Gear Fairing - Serials 2065 & subs

   (a) Acquire necessary tools, equipment, and supplies.
   (b) Apply adhesive to seal.
   (c) Position seal to strut fairing and allow to cure.

<table>
<thead>
<tr>
<th>Description</th>
<th>P/N or Spec.</th>
<th>Supplier</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plastic Scraper</td>
<td>-</td>
<td>Any Source</td>
<td>Remove residue.</td>
</tr>
<tr>
<td>Isopropyl Alcohol</td>
<td>99% or higher purity</td>
<td>Any Source</td>
<td>Clean installation area.</td>
</tr>
<tr>
<td>Cotton Cloth</td>
<td>-</td>
<td>Any Source</td>
<td>Clean installation area.</td>
</tr>
</tbody>
</table>

Epoxy Adhesive (Refer to 51-30) Any Source Secure seal.
Installation - Nose Gear Fairing

(a) Acquire necessary tools, equipment, and supplies.

(b) **Serials 1005 thru 1885 before SB 2X-32-18:** Turn nose wheel to full 108 degree deflection.

c) **Serials 1886 & subs, Serials 1005 thru 1885 after SB 2X-32-18:** Turn nose wheel to full 85 degree deflection.

d) Pry trailing edge seam of strut fairing open and position strut fairing around nose gear-strut.

e) **Serials 1005 thru 2064:** From bottom of strut fairing, insert and slide hinge pin into hinge bodies until hinge pin is fully inserted and seated.

(f) **Serials 2065 & subs:** From bottom of strut fairing, insert and slide hinge pin into lower hinge tab, through hinge bodies, and into upper hinge tab.

g) **Serials 1005 thru 2064:** Secure hinge pin to strut fairing with safety wire.

(h) **Serials 2065 & subs:** Position U-nut to end of hinge pin. Secure U-nut to strut fairing with screw.

(i) **Serials 1005 thru 2064:** Apply Loctite to strut fairing screws. *(Refer to 20-40)*

(j) **Serials 1005 thru 2064:** Install screws securing strut fairing to nose gear strut.

(k) **Serials 1005 thru 1424, 1431 thru 1475:** Install wheel pant assembly.

1. Place forward wheel pant in proper alignment with nose wheel assembly and install screws.
2. Insert upper access panel in forward wheel pant slot.
3. While supporting upper access panel, place aft wheel pant in proper alignment with forward wheel pant and apply light force to mate the wheel pants together.
4. Install screws along nose pant seam and upper access panel.

(l) **Serials 1425 thru 1430, 1476 & subs:** Install wheel pant assembly.

1. Place aft wheel pant in proper alignment with nose wheel assembly and install screws.
2. Place forward wheel pant in proper alignment with aft wheel pant and apply light force to mate the wheel pants together.
3. Install screws along nose pant seam.
4. **Serials 1886 & subs:** Rotate nose wheel fully from side to side, verifying no contact occurs between wheel pant and strut fairing. Trim strut fairing as required.

(m) Install towing lugs to nose wheel assembly.

(n) Rotate nose wheel assembly to ensure there is no interference through caster travel.

---

<table>
<thead>
<tr>
<th>Description</th>
<th>P/N or Spec.</th>
<th>Supplier</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serials 1005 thru 2064: Safety Wire</td>
<td>-</td>
<td>Any Source</td>
<td>Secure hinge pin.</td>
</tr>
<tr>
<td>Serials 1005 thru 2064: Loctite®</td>
<td>222</td>
<td>Any Source</td>
<td>Secure strut fairing.</td>
</tr>
</tbody>
</table>
Figure 32-201
Nose Gear Fairing Installation - Serials 1005 thru 1424, 1431 thru 1475 (Sheet 1 of 4)

LEGEND
1. Strut Fairing
2. Hinge Pin
3. Hinge
4. Safety Wire
5. Screw
6. Aft Wheel Pant
7. Cover
8. Bracket
9. Towing Lug
10. Forward Wheel Pant
11. Upper Access Panel

DETAIl A
Serials 1005 thru 1424, 1431 thru 1475.

Note
Hinge pin shown installed.
Figure 32-201
Nose Gear Fairing Installation - Serials 1886 thru 2064, 2065 & subs w/o Perspective (Sheet 3 of 4)

LEGEND
1. Strut Fairing
2. Hinge Pin
3. Hinge
4. Safety Wire
5. Screw
6. Aft Wheel Pant
7. Cover
8. Bracket
9. Towing Lug
10. Forward Wheel Pant

Serials 1886 thru 2064, 2065 & subs w/o Perspective Avionics.

Note
Hinge pin shown installed.
Nose Gear Fairing Installation - Serials 2065 & subs w/ Perspective (Sheet 4 of 4)

**Figure 32-201**

**Detail D**

**Serials 2065 & subs w/ Perspective Avionics.**

**Serials 2065 thru 2221.**

**Legend**
1. Strut Fairing
2. Hinge Pin
3. Hinge
4. Screw
5. Aft Wheel Pant
6. Cover
7. Bracket
8. Towing Lug
9. Forward Wheel Pant
10. U-Nut
11. Hinge Tab
12. Seal
13. Access Door

**Note**
Hinge pin shown installed.

**Effectivity:**
Serials 2065 & subs w/ Perspective

**Date:**
19 Sep 2010
B. Nose Gear Assembly - Serials 1005 thru 1885 (See Figure 32-202)

(1) Removal - Nose Gear Assembly
   (a) Remove engine cowling. (Refer to 71-10)
   (b) Remove nose gear fairing. (Refer to 32-20)
   (c) Raise airplane on jacks. (Refer to 07-10)
   (d) Remove nose wheel fork assembly. (Refer to 32-20)
   (e) With nose gear strut supported, remove cotter pin, nut, washers, and bolt securing nose gear strut to lower puck pan.
   (f) Remove cotter pins, nuts, washers, spacers, and bolts securing nose gear strut to lower engine mount.
   (g) Lower nose gear assembly to ground.

(2) Installation - Nose Gear Assembly
   (a) Acquire necessary tools, equipment, and supplies.

<table>
<thead>
<tr>
<th>Description</th>
<th>P/N or Spec.</th>
<th>Supplier</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grease</td>
<td>ASG22</td>
<td>Aeroshell</td>
<td>Lubrication.</td>
</tr>
</tbody>
</table>

(b) With nose gear assembly supported under airplane, lift strut up until bolt holes are in proper alignment with engine mount.

(c) Secure nose gear assembly to lower engine mount.
   1) Apply a thin coat of grease to bushings.

   **Note:** Additional washers may be installed between nose gear strut and engine mount as required to eliminate any gap. Two washers per side maximum.

   2) Install bolts, spacers, washers, and nuts securing nose gear strut to lower engine mount. Torque nuts to 80 - 95 in-lb (9.0 - 10.7 Nm) and install cotter pins.

(d) Secure nose gear strut to lower puck pan.
   1) Coat bolt shaft with thin coat of grease.
   2) Install bolt, washers, and nut securing nose gear strut to lower puck pan.
   3) Torque bolt to 80 - 95 in-lb (9.0 - 10.7 Nm) and install cotter pin.
   4) Install nose wheel fork assembly. (Refer to 32-20)

(e) Lower airplane off jacks. (Refer to 07-10)

(f) Install engine cowling. (Refer to 71-10)

(g) Install nose gear fairing. (Refer to 32-20)
C. Nose Gear Assembly - **Serials 1886 & subs** *(See Figure 32-202)*

1. **Removal - Nose Gear Assembly**
   
   (a) Remove engine cowling. *(Refer to 71-10)*
   
   (b) Remove nose gear fairing. *(Refer to 32-20)*
   
   (c) Raise airplane on jacks. *(Refer to 07-10)*
   
   (d) Remove nose wheel fork assembly. *(Refer to 32-20)*
   
   (e) **Serials 1005 thru 2064:** With nose gear strut, remove bolts, washers, and spacers securing nose gear strut to lower puck pan.

   (f) **Serials 2065 & subs:** Remove nose gear strut from oleo strut.

   1. Remove cap nut from fill valve stem.
   2. Slowly open fill valve to bleed nitrogen from oleo strut.

   **Note:** During de-pressurization, drops of hydraulic fluid may be expelled from fill valve. Position shop towel as required below fill valve to prevent spillage.

   3. Allow one minute to de-pressurize oleo strut.

   4. With nose gear strut supported, remove cotter pin, nut, spacer, flanged bushing, washer, and bolt securing nose gear strut to oleo strut.

   (g) **Serials 1005 thru 2064:** Remove cotter pins, nuts, washers, spacers, and bolts securing nose gear strut to lower engine mount.

   (h) **Serials 2065 & subs:** Remove cotter pins, nuts, washers, spacers, bushings, flanged bushings, and bolts securing nose gear strut to lower engine mount and firewall.

   (i) Lower nose gear assembly to ground.

2. **Installation - Nose Gear Assembly**

   (a) Acquire necessary tools, equipment, and supplies.

   (b) With nose gear assembly supported under airplane, lift strut up until bolt holes are in proper alignment with engine mount.

   (c) Secure nose gear assembly to lower engine mount.

   1. Coat bolt shafts and spacers with thin coat of grease.

   2. **Serials 1005 thru 2064:** Install bolts, spacers, washers, and nuts.

   **Note:** **Serials 2065 & subs:** Flanged bushing thickness may not exceed maximum allowable gap of 0.01 inch (0.25 mm).

   3. **Serials 2065 & subs:** Install bolts, flanged bushings, bushings, spacers, washers, and nuts.

   **Note:** If total gap measures between 0.125 to 0.250 inch (3.18 to 6.35 mm), install one additional washer to each side. If total gap measures between 0.250 to 0.375 inch (6.35 to 9.53 mm), install two additional washers to each side. If total gap exceeds 0.375 inch (9.53 mm), contact Cirrus Design for disposition.

---

**Description** | **P/N or Spec.** | **Supplier** | **Purpose**
--- | --- | --- | ---
Grease | ASG22 | Aeroshell | Lubrication.
Safety Wire | - | Any Source | Secure nose gear strut bolts.

---

EFFECTIVITY: Serials 1886 & subs

32-20
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31 May 2011
4. With bolt against nose gear strut, measure total gap (add right and left side gaps) between spacer and engine mount. If necessary, install additional washers.

5. **Serials 1005 thru 2064:** Torque nuts to 480 - 690 in-lb (53 - 76 Nm).

6. **Serials 2065 & subs:** Torque nuts to 100 - 140 in-lb (11.4 - 15.8 Nm).

7. Install cotter pins.

(d) **Serials 1005 thru 2064:** Secure nose gear strut to lower puck pan.

1. Coat bolt shafts with thin coat of grease.

2. Install bolts, washers, and spacers.

3. Torque bolts to 480 - 690 in-lb (53 - 76 Nm).

4. Safety wire bolts to nose gear strut.

(e) **Serials 2065 & subs:** Secure nose gear strut to oleo strut.

1. Coat bolt shaft with thin coat of grease.

2. Support nose gear strut under airplane and lift strut up until bolt holes are in proper alignment with bottom of oleo strut.

   **CAUTION:** Ensure flanged bushing is installed to RH inboard side of mounting tab on nose gear strut.

3. Install bolt, washer, flanged bushing, spacer, and nut securing nose gear strut to oleo strut. Torque nut to 480 - 690 in-lb (54 - 77 Nm). Install cotter pin.

4. Perform Servicing - Oleo Strut Fluid and Gas Replenishment. (Refer to 12-10)

(f) Lower airplane off jacks. (Refer to 07-10)

(g) Install nose gear fairing. (Refer to 32-20)

(h) Install engine cowling. (Refer to 71-10)
NOTES

⚠️ Apply a thin coat of grease to bushings.

⚠️ Additional washers may be installed between nose gear strut and engine mount as required to eliminate any gap. Two washers per side maximum.

LEGEND

1. Castellated Nut
2. Cotter Pin
3. Washer
4. Bumper
5. Engine Mount Weldment
6. Puck
7. Spacer
8. Puck Tray
9. Bolt
10. Nose Gear Strut
11. Bushing
12. Towbar Lug
13. Pant Bracket

Figure 32-202
Nose Gear Assembly - Serials 1005 thru 1885 (Sheet 1 of 3)
Figure 32-202
Nose Gear Assembly - Serials 1886 thru 2064 (Sheet 2 of 3)

LEGEND
1. Cotter Pin
2. Nut
3. Washer
4. Spacer
5. Bolt
6. Nose Gear Strut
7. Upper Puck Pan
8. Puck
9. Lower Puck Pan
10. Bumper
11. Wheel Pant Bracket
12. Towing Lug
13. Flanged Bushing

DETAIL
Serials 1886 thru 2064, 2065 & subs w/o Perspective Avionics.
NOTE

⚠️ Torque to 240 - 300 in-lb (27.1 - 33.9 Nm).
⚠️ Flanged bushing must be installed at RH inboard mounting tab.
⚠️ If gap between engine mount and oleo strut exceeds 0.030 inch (0.76 mm), install washer at LH side oleo strut.
⚠️ Flanged bushing thickness may not exceed maximum allowable gap of 0.01 inch (0.25 mm).

DETAIL C

SERIALS 2065 & SUBS W/ PERSPECTIVE AVIONICS

LEGEND
1. Cotter Pin
2. Nut
3. Washer
4. Spacer
5. Bolt
6. Nose Gear Strut
11. Wheel Pant Bracket
12. Towing Lug
13. Flanged Bushing
14. Oleo Strut
15. Sealing Ring
16. Fill Valve

Figure 32-202
Nose Gear Assembly - Serials 2065 & subs (Sheet 3 of 3)
(3) Inspection/Check - Nose Gear Assembly - Serials 1005 thru 1885 (See Figure 32-203)

(a) Acquire necessary tools, equipment, and supplies.

<table>
<thead>
<tr>
<th>Description</th>
<th>P/N or Spec.</th>
<th>Supplier</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grease</td>
<td>ASG22</td>
<td>Aeroshell</td>
<td>Lubrication.</td>
</tr>
<tr>
<td>Flashlight</td>
<td>-</td>
<td>Any Source</td>
<td>Inspect fillet weld.</td>
</tr>
<tr>
<td>10X Magnifier</td>
<td>-</td>
<td>Any Source</td>
<td>Inspect fillet weld.</td>
</tr>
</tbody>
</table>

(b) Verify minimum propeller clearance for airplane. (Refer to 06-00)

(c) Remove engine cowling. (Refer to 71-10)

(d) Remove nose gear fairing. (Refer to 32-20)

(e) Raise airplane on jacks. (Refer to 07-10)

(f) Inspect nose gear strut and attach points for security, cracks, and corrosion.

(g) Perform Wheel Spindle Weld Inspection.
    Visually inspect the fillet weld between the nose gear strut and wheel spindle in accordance with FAA AC 43.13-1B, Chapter 5, Section 2.
    1 Using flashlight and 10X magnifier, visually inspect fillet weld for signs of distress.
    2 Verify there is no evidence of cracking in paint on or around surface of fillet weld.
    3 Verify there is no evidence of deformation in nose gear strut on or around surface of fillet weld.

(h) Perform Upper Strut Plate Weld Inspection.
    Visually inspect the fillet welds between the upper strut plate and attach point arms in accordance with FAA AC 43.13-1B, Chapter 5, Section 2.
    1 Using flashlight and 10X magnifier, visually inspect fillet weld for signs of distress.
    2 Verify there is no evidence of cracking in paint on or around surface of fillet weld.
    3 Verify there is no evidence of deformation in strut plates on or around surface of fillet weld.

(i) Inspect pucks for delamination, cracking, or other distress.

(j) Inspect nose wheel fork assembly and spindle for security, cracks, corrosion, and cleanliness.

(k) Attach spring scale to axle on nose wheel fork assembly and verify a constant force of 20 - 25 lbs (9.1 - 11.3 kg) is required to rotate nose wheel fork and wheel assembly. (See Figure 32-205)

    CAUTION: Do not allow grease to come in contact with spindle bearing surface or nose wheel fork bearings. Failure to comply with this caution may result in nose wheel shimmy.

(l) Apply a thin coat of grease to exposed spindle threads.

(m) Verify security of spindle nut cotter pin.

(n) Lower airplane off jacks. (Refer to 07-10)

(o) Install nose gear fairing. (Refer to 32-20)

(p) Install engine cowling. (Refer to 71-10)
(4) Inspection/Check - Nose Gear Assembly - Serials 1886 & subs (See Figure 32-203)

(a) Acquire necessary tools, equipment, and supplies.

<table>
<thead>
<tr>
<th>Description</th>
<th>P/N or Spec.</th>
<th>Supplier</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
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<td>Grease</td>
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<td>Aeroshell</td>
<td>Lubrication.</td>
</tr>
<tr>
<td>Calibrated Spring Scale</td>
<td>5A354</td>
<td>Chatillon</td>
<td>Load determination.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>83-30 Kew Gardens Rd</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kew Gardens, NY 11415</td>
<td></td>
</tr>
<tr>
<td>Flashlight</td>
<td></td>
<td>Any Source</td>
<td>Inspect welds.</td>
</tr>
<tr>
<td>10X Magnifier</td>
<td></td>
<td>Any Source</td>
<td>Inspect welds.</td>
</tr>
<tr>
<td>Inspection Mirror</td>
<td></td>
<td>Any Source</td>
<td>Inspect for cracking.</td>
</tr>
<tr>
<td>Vernier Caliper</td>
<td></td>
<td>Any Source</td>
<td>Inspect upper puck pan assembly.</td>
</tr>
<tr>
<td>Paint Remover</td>
<td></td>
<td>Any Source</td>
<td>Remove paint and primer.</td>
</tr>
<tr>
<td>Paint</td>
<td>(Refer to 51-30)</td>
<td>(Refer to 51-30)</td>
<td>Repair inspection area.</td>
</tr>
<tr>
<td>Primer</td>
<td>(Refer to 51-30)</td>
<td>(Refer to 51-30)</td>
<td>Repair inspection area.</td>
</tr>
</tbody>
</table>

(b) Verify minimum propeller clearance for airplane. (Refer to 06-00)
(c) Remove engine cowlng. (Refer to 71-10)
(d) Remove nose gear fairing. (Refer to 32-20)
(e) Raise airplane on jacks. (Refer to 07-10)
(f) Inspect nose gear strut and attach points for security, cracks, and corrosion.
(g) Perform Wheel Spindle Weld Inspection.
   Visually inspect the fillet weld between the nose gear strut and wheel spindle in accordance with FAA AC 43.13-1B, Chapter 5, Section 2.
   1 Using flashlight and 10X magnifier, visually inspect fillet weld for signs of distress.
   2 Verify there is no evidence of cracking in paint on or around surface of fillet weld.
   3 Verify there is no evidence of deformation to nose gear strut on or around surface of fillet weld. If deformation is identified, contact Cirrus Design for disposition.
(h) Serials 1886 thru 2064: Perform Upper Gusset Plate Inspection.
   At upper gusset plate, use flashlight and inspection mirror to visually inspect in accordance with FAA AC 43.13-1B, Chapter 5, Section 2 for evidence of cracking developing through the gusset plate and extending toward the puck stack fork slots. If crack is identified extending toward either puck stack fork slot, determine extent of damage.
   1 If crack does not extend into yoke tube, and does not reach either puck stack fork slot, crack length is allowable for continued operation. Re-inspect every 100 flight hours in accordance with Chapter 5-20, Scheduled Maintenance Checks. (Refer to 05-20)
   2 If crack reaches either puck stack fork slot, nose gear assembly must be replaced within 100 flight hours. (Refer to 32-20)
   3 If crack extends into yoke tube, contact Cirrus Design for disposition.
EFFECTIVITY:
Serials 1886 & subs

(i) **Serials 1886 thru 2064: Perform Forward Nose Gear Strut Fillet Weld Inspection.**

At upper section of nose gear strut where strut enters the nose gear assembly, use flashlight and 10X magnifier to visually inspect forward surface of forward fillet welds attaching strut to nose gear assembly in accordance with FAA AC 43.13-1B, Chapter 5, Section 2 for indications of damage. If welds show indications of damage (i.e. cracks, rust lines, loose paint), determine extent of damage.

1. Using paint remover, remove surface protection to expose welds.
2. Wire brush area to remove all loose debris and/or corrosion.
3. Dye penetrant inspect in accordance with FAA AC 43.13-1B, Chapter 5, Section 5.
4. If crack is identified in either weld, perform Approved Repair - Nose Landing Gear Reinforcement. (Refer to 32-20)
5. Apply primer and paint to inspection area. (Refer to 51-20)

(j) Inspect nose wheel fork assembly and spindle for security, cracks, corrosion, and cleanliness.

(k) Attach spring scale to axle on nose wheel fork assembly and verify a constant force of 20 - 25 lbs (9.1 - 11.3 kg) is required to rotate nose wheel fork and wheel assembly.

**CAUTION:** Do not allow grease to come in contact with spindle bearing surface or nose wheel fork bearings. Failure to comply with the caution may result in nose wheel shimmy.

(l) Apply a thin coat of grease to exposed spindle threads.

(m) Verify security of spindle nut cotter pin.

(n) Lower airplane off jacks. (Refer to 07-10)

(o) **Serials 2065 & subs: Inspect oleo strut.**

1. Perform Inspection/Check - Oleo Strut. (Refer to 32-20)

(p) Install nose gear fairing. (Refer to 32-20)

(q) Install engine cowling. (Refer to 71-10)

(5) **Approved Repair - Nose Landing Gear Reinforcement - Serials 1886 thru 2064 (See Figure 32-203)**

This repair may be used to reinforce fillet welds where strut enters the nose gear assembly. This reinforcement provides an alternate load path for the forward cross tube so that stress to nose gear strut fillet welds is eliminated.

(a) Acquire necessary tools, equipment, and supplies.

<table>
<thead>
<tr>
<th>Description</th>
<th>P/N or Spec.</th>
<th>Supplier</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reamer</td>
<td>0.625-inch</td>
<td>Any Source</td>
<td>Enlarge inner cross tube diameter.</td>
</tr>
<tr>
<td>Compressed Air</td>
<td>-</td>
<td>Any Source</td>
<td>Remove debris.</td>
</tr>
<tr>
<td>Hammer</td>
<td>-</td>
<td>Any Source</td>
<td>Facilitate bolt insertion.</td>
</tr>
<tr>
<td>Grease</td>
<td>ASG22</td>
<td>Aeroshell</td>
<td>Corrosion protection.</td>
</tr>
<tr>
<td>Bolt</td>
<td>NAS6610-73</td>
<td>Any Source</td>
<td>Reinforce fillet welds.</td>
</tr>
<tr>
<td>Washer</td>
<td>NAS1149F1063P</td>
<td>Any Source</td>
<td>Reinforce fillet welds.</td>
</tr>
<tr>
<td>Nut</td>
<td>MS21044N10</td>
<td>Any Source</td>
<td>Reinforce fillet welds.</td>
</tr>
<tr>
<td>Torque Wrench</td>
<td>1100 to 1300 in-lb</td>
<td>Any Source</td>
<td>Torque hardware.</td>
</tr>
</tbody>
</table>
(b) Apply sufficient grease to fully coat bolt.
(c) Ensure bolt passes through forward cross tube of nose gear assembly. It is permissible to lightly tap bolt through forward cross tube with hammer.
(d) If inner diameter of cross tube prevents bolt insertion, use reamer to enlarge cross tube to 0.635 inch (16.129 mm) maximum.
(e) Using compressed air, remove any debris from forward cross tube.
(f) Install bolt, washers, and nut through forward cross tube of nose gear assembly. Torque to 1100 to 1300 in-lb (124.3 to 146.9 Nm).
Using flashlight and 10X magnifier, visually inspect nose wheel fork assembly and spindle for security, cracks, corrosion, and cleanliness.

Using flashlight and 10X magnifier, visually inspect nose gear strut and attach points for security, cracks, and corrosion.

Using flashlight and 10X magnifier, visually inspect pucks for delamination, cracking, or other signs of distress.

Using flashlight and inspection mirror at aft fillet weld, verify there is no evidence of cracking developing transverse through the attach point arms.
Using flashlight and 10X magnifier, visually inspect fillet weld for cracking, deformation, and signs of distress in accordance with FAA AC 43.13-1B, Chapter 5, Section 2.

At upper section of nose gear strut where strut enters the nose gear assembly, use flashlight and 10X magnifier to visually inspect the forward surface of the forward fillet welds attaching the strut to the nose gear assembly in accordance with FAA AC 43.13-1B, Chapter 5, Section 2.

If inner diameter of cross tube prevents bolt insertion, use reamer to enlarge cross tube to 0.635 inch (16.129 mm) maximum.

Torque to 1100 to 1300 in-lb (124.3 to 146.9 Nm).

Using flashlight and 10X magnifier, visually inspect fillet weld for cracking, deformation, and signs of distress in accordance with FAA AC 43.13-1B, Chapter 5, Section 2.

NOTE

At upper gusset plate, use flashlight and inspection mirror to visually inspect upper gusset plate for evidence of cracking developing through the gusset plate and extending toward the puck stack fork slots in accordance with FAA AC 43.13-1B, Chapter 5, Section 2.

If crack does not extend into yoke tube, and does not reach either puck stack fork slot, crack length is allowable for continued operation. Re-inspect Upper Gusset Plate every 100 flight hours in accordance with Chapter 5-20, Scheduled Maintenance Checks.

If crack reaches either puck stack fork slot, nose gear assembly must be replaced within 100 flight hours.

If crack extends into yoke tube, contact Cirrus Design for disposition.

At upper section of nose gear strut where strut enters the nose gear assembly, use flashlight and 10X magnifier to visually inspect the forward surface of the forward fillet welds attaching the strut to the nose gear assembly in accordance with FAA AC 43.13-1B, Chapter 5, Section 2.

If inner diameter of cross tube prevents bolt insertion, use reamer to enlarge cross tube to 0.635 inch (16.129 mm) maximum.

Torque to 1100 to 1300 in-lb (124.3 to 146.9 Nm).

Using flashlight and 10X magnifier, visually inspect fillet weld for cracking, deformation, and signs of distress in accordance with FAA AC 43.13-1B, Chapter 5, Section 2.

Figure 32-203

Inspection/Check - Nose Gear Assembly - Serials 1886-2064, 2065 & subs w/o Perspective (Sheet 2 of 3)

EFFECTIVITY:
Serials 1886-2064, 2065 & subs w/o Perspective

32-20
Page 21
31 May 2011
Verify spherical bearings at oleo strut attach points are fully captured.

**NOTE**

⚠️ Using flashlight and 10X magnifier, visually inspect fillet weld for cracking, deformation, and signs of distress in accordance with FAA AC 43.13-1B, Chapter 5, Section 2.

⚠️ Inspect oleo strut for security, cracks, corrosion, and cleanliness.

⚠️ Verify measurement of exposed piston rod is approximately 2.25 - 2.50 inches (5.72 - 6.35 cm).

⚠️ Verify spherical bearings at oleo strut attach points are fully captured.

---

**Figure 32-203**

**Inspection/Check - Nose Gear Assembly - Serials 2065 & subs (Sheet 3 of 3)**

**EFFECTIVITY:**

Serials 2065 & subs
D. Nose Gear Puck Stack Assembly - Serials 1005 thru 1885
(See Figure 32-202)

(1) Removal - Nose Gear Puck Stack Assembly
(a) Remove engine cowling. (Refer to 71-10)
(b) Remove nose gear fairing. (Refer to 32-20)
(c) Raise airplane on jacks. (Refer to 07-10)
(d) With nose gear strut supported, remove cotter pin, nut, washers, and bolt securing nose
gear strut to lower puck pan.
(e) Remove cotter pins, nuts, washers, and bumpers securing top of puck stack assembly to
engine mount and remove puck stack assembly from airplane.

(2) Installation - Nose Gear Puck Stack Assembly
(a) Acquire necessary tools, equipment, and supplies.
(b) Support nose gear strut under airplane and lift strut up until bolt holes are in proper align-
ment with lower puck pan.
(c) Apply a thin coat of grease to bolt shaft.
(d) Install bolt, washers, and nut securing nose gear strut to lower puck pan. Torque bolts to
80 - 95 in-lb (9.0 - 10.7 Nm) and install cotter pin.
(e) Lower airplane off jacks. (Refer to 07-10)
(f) Perform Inspection/Check - Nose Gear Puck Stack Assembly. (Refer to 32-20)
(g) Install bumpers, washers and nuts securing top of puck stack assembly to engine mount.
Tighten nuts such that 2 - 3 threads are showing and install cotter pins.
(h) Install nose gear fairing. (Refer to 32-20)
(i) Install engine cowling. (Refer to 71-10)

(3) Inspection/Check - Nose Gear Puck Stack Assembly
(a) Acquire necessary tools, equipment, and supplies.

<table>
<thead>
<tr>
<th>Description</th>
<th>P/N or Spec.</th>
<th>Supplier</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grease</td>
<td>ASG22</td>
<td>Aeroshell</td>
<td>Lubrication.</td>
</tr>
</tbody>
</table>

(b) Place scale under each wheel.
(c) Level airplane. (Refer to 08-10)
(d) If necessary, add ballast until nose wheel scale indicates 509 lbs (231 kg). Total weight of
airplane (all three scales) to equal 2694 lbs (1222 kg) at 16.7% MAC.
(e) Position a propeller blade vertically to the floor.
(f) Measure from propeller blade tip to floor.
(g) Subtract scale height from measurement to determine propeller clearance.

**CAUTION:** Airplanes with 2 blade propeller at 76.00 inch (193.04 cm) diameter require
7.00 inch (17.78 cm) minimum clearance. Airplanes with 3 blade propeller
at 74.00 inch (187.96 cm) diameter require 8.00 inch (20.32 cm) minimum
clearance.

**Note:** Two scales of equal height must be used for the main gear wheels.
(h) If necessary, add shims to nose gear puck stack assembly to obtain propeller clearance.

1. Acquire necessary tools, equipment, and supplies.

<table>
<thead>
<tr>
<th>Description</th>
<th>P/N or Spec.</th>
<th>Supplier</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shim - 0.032 inch (0.081 cm)</td>
<td>Refer to IPC</td>
<td>Cirrus Design</td>
<td>Adjust puck stack height.</td>
</tr>
<tr>
<td>Shim - 0.063 inch (0.160 cm)</td>
<td>Refer to IPC</td>
<td>Cirrus Design</td>
<td>Adjust puck stack height.</td>
</tr>
<tr>
<td>Shim - 0.090 inch (0.229 cm)</td>
<td>Refer to IPC</td>
<td>Cirrus Design</td>
<td>Adjust puck stack height.</td>
</tr>
<tr>
<td>Shim - 0.125 inch (0.318 cm)</td>
<td>Refer to IPC</td>
<td>Cirrus Design</td>
<td>Adjust puck stack height.</td>
</tr>
<tr>
<td>Shim - 0.250 inch (0.635 cm)</td>
<td>Refer to IPC</td>
<td>Cirrus Design</td>
<td>Adjust puck stack height.</td>
</tr>
<tr>
<td>Shim - 0.50 inch (1.27 cm)</td>
<td>Refer to IPC</td>
<td>Cirrus Design</td>
<td>Adjust puck stack height.</td>
</tr>
</tbody>
</table>

2. Remove ballast from nose wheel.
3. Remove nose gear puck stack assembly. *(Refer to 32-20)*
4. Add shims to bottom of puck stack as required to obtain propeller clearance.
5. Install nose gear puck stack assembly. *(Refer to 32-20)*
E. Nose Gear Puck Stack Assembly - Serials 1886 thru 2064 (See Figure 32-202)

(1) Removal - Nose Gear Puck Stack Assembly
   (a) Remove engine cowling. (Refer to 71-10)
   (b) Remove nose gear fairing. (Refer to 32-20)
   (c) Raise airplane on jacks. (Refer to 07-10)
   (d) With nose gear strut supported, remove bolts, washers, and spacers securing nose gear strut to lower puck pan.
   (e) Remove nut, washer, spacers, and bolt securing upper puck pan to engine mount. Remove puck stack assembly from airplane.

(2) Disassembly - Nose Gear Puck Stack Assembly
   (a) Remove cotter pin, nut, washers, and bumper securing lower and upper puck pans together.

   Note: To facilitate reinstallation, note orientation and position of pucks prior to removal. Pucks must be reinstalled in same orientation and order as previous installation.

   (b) Remove pucks from shaft of upper puck pan.

(3) Assembly - Nose Gear Puck Stack Assembly
   (a) Slide pucks onto shaft of upper puck pan.

   CAUTION: Do not torque nut securing lower and upper puck pans together. Tighten nut until cotter pin hole is aligned with nut castellations.

   (b) Install bumper, washers, nut, and cotter pin securing lower and upper puck pans together.

(4) Installation - Nose Gear Puck Stack Assembly
   (a) Acquire necessary tools, equipment, and supplies.

   (b) Coat bolt shafts with thin coat of grease.
   (c) Align top of puck stack assembly with engine mount and secure with bolt, washer, spacers, and nut.
   (d) Support nose gear strut under airplane and lift strut up until bolt holes are in proper alignment with lower puck pan.
   (e) Install bolts, washers, and spacers securing nose gear strut to lower puck pan. Torque bolts to 480 - 690 in-lb (53 - 76 Nm). Safety wire bolts to nose gear strut.
   (f) Lower airplane off jacks. (Refer to 07-10)
   (g) Install nose gear fairing. (Refer to 32-20)
   (h) Install engine cowling. (Refer to 71-10)

(5) Inspection/Check - Nose Gear Puck Stack Assembly (See Figure 32-204)
   (a) Visual Inspection of pucks for cracking or splitting. Ensure attach bolts are perpendicular to puck tray and puck stack-up is in alignment. If polymer pucks or attaching parts show evidence of excessive wear or damage, perform the following:
   (b) Remove and inspect puck pan assembly.
      1 Remove cotter pin, nut, washers, and bumper securing lower and upper puck pans together.

<table>
<thead>
<tr>
<th>Description</th>
<th>P/N or Spec.</th>
<th>Supplier</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Grease</td>
<td>ASG22</td>
<td>Aeroshell</td>
<td>Lubrication.</td>
</tr>
</tbody>
</table>
2 With nose gear strut supported, remove bolts, washers, and spacers securing nose gear strut to lower puck pan.

Note: To facilitate reinstallation, note orientation and position of pucks prior to removal. Pucks must be reinstalled in same orientation and order as previous installation.

3 Remove pucks and spacer from upper puck pan shaft.

4 Inspect pucks for delamination, cracking, or other distress.

5 At lower puck pan assembly, inspect flanged bushing, bumper, and attaching hardware for wear and condition.

(c) Perform Upper Puck Pan Weld Inspection.

At upper puck pan, visually inspect the weld securing shaft to upper puck pan in accordance with FAA AC 43.13-1B, Chapter 5, Section 2.

1 Using flashlight and 10X magnifier, visually inspect weld for signs of distress.

2 Verify there is no evidence of cracking on or around surface of weld.

3 Verify there is no evidence of deformation to upper puck pan on or around surface of weld. If deformation is identified, contact Cirrus Design for disposition.

(d) Perform Upper Puck Pan Shaft Inspection.

Inspect upper puck pan shaft for wear and condition. If wear is found, perform the following:

1 Using vernier caliper, measure wall thickness of shaft lower end to determine a baseline wall thickness.

2 Using vernier caliper, measure wall thickness of shaft where shaft rubs against lower puck pan. If wear exceeds 50% of baseline wall thickness, the upper puck pan assembly must be replaced. Contact Cirrus Design for disposition.

(e) Re-install puck pan assembly.

1 Install spacer and pucks onto shaft of upper puck pan.

CAUTION: Do not torque nut securing lower and upper puck pans together. Tighten nut until cotter pin hole is aligned with nut castellations.

2 Install bumper, washers, nut, and cotter pin securing lower and upper puck pans together.

3 Install bolts, washers, and spacers securing nose gear strut to lower puck pan. Torque bolts to 480 - 690 in-lb (53 - 76 Nm). Safety wire bolts to nose gear strut.
Inspection/Check - Nose Gear Puck Stack Assembly - Serials 1886 thru 2064

NOTE

⚠️ Using flashlight and 10X magnifier, visually inspect the weld securing shaft to upper puck pan for cracking, deformation, and signs of distress in accordance with FAA AC 43.13-1B, Chapter 5, Section 2.

⚠️ Inspect upper puck pan shaft for wear. If wear is found, perform the following: using vernier caliper, measure wall thickness of shaft lower end to determine baseline wall thickness. Using vernier caliper, measure wall thickness of shaft where shaft rubs against lower puck pan. If wear exceeds 50% of baseline wall thickness, the upper puck pan assembly must be replaced.

⚠️ At lower puck pan assembly, inspect flanged bushing, bumper, and attaching hardware for wear and condition.

Figure 32-204

Inspection/Check - Nose Gear Puck Stack Assembly - Serials 1886 thru 2064

NOTE

⚠️ Using flashlight and 10X magnifier, visually inspect the weld securing shaft to upper puck pan for cracking, deformation, and signs of distress in accordance with FAA AC 43.13-1B, Chapter 5, Section 2.

⚠️ Inspect upper puck pan shaft for wear. If wear is found, perform the following: using vernier caliper, measure wall thickness of shaft lower end to determine baseline wall thickness. Using vernier caliper, measure wall thickness of shaft where shaft rubs against lower puck pan. If wear exceeds 50% of baseline wall thickness, the upper puck pan assembly must be replaced.

⚠️ At lower puck pan assembly, inspect flanged bushing, bumper, and attaching hardware for wear and condition.
F. Oleo Strut - Serials 2065 & subs (See Figure 32-202)

(1) Removal - Oleo Strut
(a) Remove engine cowling. (Refer to 71-10)
(b) Remove nose gear fairing. (Refer to 32-20)
(c) Attach weighted jack stand at aft tail tiedown and raise nose of airplane. (Refer to 07-10)
(d) With nose gear strut supported, remove cotter pin, nut, spacer, flanged bushing, washer, and bolt securing nose gear strut to oleo strut.
(e) Remove cotter pin, nut, spacer, flanged bushing, washer, and bolt securing oleo strut to engine mount. Remove oleo strut from airplane.

(2) Installation - Oleo Strut
(a) Acquire necessary tools, equipment, and supplies.
(b) Coat bolt shafts with thin coat of grease.

**CAUTION:** Ensure flanged bushing is installed to RH inboard side of mounting tab on engine mount.

**Note:** If gap between engine mount and oleo strut exceeds 0.030 inch (0.76 mm), install washer at LH side oleo strut.
(c) Align top of oleo strut with engine mount and secure with bolt, washer, flanged bushing, spacer, and nut. Torque nut to 480 - 690 in-lb (54 - 77 Nm). Install cotter pin.
(d) Support nose gear strut under airplane and lift strut up until bolt holes are in proper alignment with bottom of oleo strut.

**CAUTION:** Ensure flanged bushing is installed to RH inboard side of mounting tab on nose gear strut.
(e) Install bolt, washer, flanged bushing, spacer, and nut securing nose gear strut to oleo strut. Torque nut to 480 - 690 in-lb (54 - 77 Nm). Install cotter pin.
(f) Lower nose of airplane and remove weighted jack stand from aft tail tiedown. (Refer to 07-10)
(g) Perform Inspection/Check - Oleo Strut. (Refer to 32-20)
(h) Install nose gear fairing. (Refer to 32-20)
(i) Install engine cowling. (Refer to 71-10)

(3) Inspection/Check - Oleo Strut
(a) Remove RH lower engine cowling. (Refer to 71-10)
(b) Inspect oleo strut for security, cracks, corrosion, and cleanliness.
(c) Verify spherical bearings at oleo strut attach points are fully captured.
(d) With aircraft between basic empty weight and maximum ramp weight without cargo or passengers, apply rocking force to nose of airplane. Allow airplane to stabilize.
(e) At room temperature, verify measurement of exposed piston rod is approximately 2.25 - 2.50 inches (5.72 - 6.35 cm). (See Figure 32-203)
(f) If exposed piston rod length is below tolerance, oleo strut requires nitrogen gas replenishment. Perform Servicing - Oleo Strut Fluid and Gas Replenishment. (Refer to 12-10)
(g) Install RH lower engine cowling. (Refer to 71-10)

<table>
<thead>
<tr>
<th>Description</th>
<th>P/N or Spec.</th>
<th>Supplier</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grease</td>
<td>ASG22</td>
<td>Aeroshell</td>
<td>Lubrication.</td>
</tr>
</tbody>
</table>

Description of parts:

<table>
<thead>
<tr>
<th>Description</th>
<th>P/N or Spec.</th>
<th>Supplier</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grease</td>
<td>ASG22</td>
<td>Aeroshell</td>
<td>Lubrication.</td>
</tr>
</tbody>
</table>
(4) Adjustment/Test - Oleo Strut

(a) Acquire necessary tools, equipment, and supplies.

<table>
<thead>
<tr>
<th>Description</th>
<th>P/N or Spec.</th>
<th>Supplier</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isopropyl Alcohol</td>
<td>99% or higher purity</td>
<td>Any Source</td>
<td>Surface cleaning.</td>
</tr>
<tr>
<td>Cotton cloth (clean, white, lint free)</td>
<td>-</td>
<td>Any Source</td>
<td>Surface cleaning.</td>
</tr>
<tr>
<td>Sandpaper</td>
<td>400-grit</td>
<td>Any Source</td>
<td>Polish out light scratches.</td>
</tr>
<tr>
<td>Paint</td>
<td>(Refer to 51-30)</td>
<td>(Refer to 51-30)</td>
<td>Repair inspection area.</td>
</tr>
<tr>
<td>Primer</td>
<td>(Refer to 51-30)</td>
<td>(Refer to 51-30)</td>
<td>Repair inspection area.</td>
</tr>
<tr>
<td>Pressurized Nitrogen Tank</td>
<td>-</td>
<td>Any Source</td>
<td>Verify nitrogen pressure.</td>
</tr>
<tr>
<td>High-Pressure Hose w/ 5/16-inch Threaded Fitting</td>
<td>-</td>
<td>Any Source</td>
<td>Verify nitrogen pressure.</td>
</tr>
</tbody>
</table>

(b) Remove engine cowling. *(Refer to 71-10)*
(c) Remove nose gear fairing. *(Refer to 32-20)*
(d) Attach weighted jack stand at aft tail tiedown and raise nose of airplane. *(Refer to 07-10)*
(e) Solvent clean oleo strut surfaces and dry with clean cloth. *(Refer to 20-30)*
(f) Perform visual inspection of fill valve and seal.
(g) If evidence of hydraulic fluid leakage is identified at fill valve, replace seal, or fill valve and seal, as required. *(Refer to 32-20)*
(h) Perform visual inspection of piston rod surface along entire length.
(i) If corrosion is identified on piston rod surface, remove corrosion.
   1. After thorough removal of corrosion, solvent clean oleo strut surfaces and dry with clean cloth. *(Refer to 20-30)*
   2. Apply primer and paint to painted surfaces as required. *(Refer to 51-20)*
(j) If minor damage to piston rod surface is identified, i.e. light scratches, it is permissible to repair piston rod surface.
   1. Use 400-grit sandpaper to polish out scratches on piston rod surface.
   2. Solvent clean oleo strut surfaces and dry with clean cloth. *(Refer to 20-30)*
   3. If scratches cannot be minimized, replace oleo strut. *(Refer to 32-20)*

**CAUTION:** If minor damage is exceeded, piston rod compression may introduce contaminants past sealing elements and, over time, cause cumulative damage to sealing elements resulting in leakage. Additionally, contaminants drawn past sealing elements can enter hydraulic system causing further damage.

(k) If more extensive damage to piston rod surface is identified, i.e. heavy scratches, gouges, etc., replace oleo strut. *(Refer to 32-20)*
(l) If evidence of hydraulic fluid leakage is identified by streamlet(s) on piston rod, replace oleo strut. *(Refer to 32-20)*

**Note:** A slightly moist film of hydraulic fluid on piston rod is a normal characteristic of sealing element lubrication.
(m) If hydraulic fluid volume is suspected insufficient, replenish fluid and gas per Servicing - Oleo Strut Fluid and Gas Replenishment. (Refer to 12-10)

(n) If nitrogen gas volume is suspected insufficient, replenish gas per Servicing - Oleo Strut Fluid and Gas Replenishment. (Refer to 12-10)

(o) Lower nose of airplane and remove weighted jack stand from aft tail tiedown. (Refer to 07-10)

(p) Install nose gear fairing. (Refer to 32-20)

(q) Install engine cowling. (Refer to 71-10)
G. Oleo Strut Fill Valve - Serials 2065 & subs (See Figure 32-202)

(1) Removal - Oleo Strut Fill Valve
   (a) Remove engine cowling. (Refer to 71-10)
   (b) Attach weighted jack stand at aft tail tiedown and raise nose of airplane. (Refer to 07-10)
   (c) Remove oleo strut. (Refer to 32-20)

   Note: To prevent oil spillage, maintain oleo strut horizontally with fill valve hole up.

   (d) Remove cap nut from fill valve stem.
   (e) Slowly open fill valve to bleed nitrogen from oleo strut.

   WARNING: Do not attempt to remove fill valve until oleo strut has been completely de-pressurized. Fill valve will be ejected at high velocity if unscrewed before nitrogen pressure has been released.

   Note: During de-pressurization, drops of hydraulic fluid may be expelled from fill valve. Position shop towel as required below fill valve to prevent spillage.

   (f) Allow one minute to de-pressurize oleo strut.
   (g) Remove fill valve from oleo strut.

(2) Installation - Oleo Strut Fill Valve
   (a) Acquire necessary tools, equipment, and supplies.

   (b) Install fill valve with new sealing ring to oleo strut. Torque to 240 - 300 in-lb (27.1 - 33.9 Nm).
   (c) Perform Servicing - Oleo Strut Fluid and Gas Replenishment. (Refer to 12-10)
   (d) Install cap nut to fill valve stem.
   (e) Install oleo strut. (Refer to 32-20)
   (f) Lower nose of airplane and remove weighted jack stand from aft tail tiedown. (Refer to 07-10)
   (g) Install engine cowling. (Refer to 71-10)
H. Nose Wheel Fork Assembly *(See Figure 32-205)*

(1) Removal - Nose Wheel Fork Assembly

(a) Remove nose gear fairing. *(Refer to 32-20)*
(b) Raise airplane on jacks *(Refer to 07-10)*
(c) While supporting fork assembly, remove cotter pin, nut, flat washers, and Belleville washers from spindle bolt.
(d) Remove fork assembly from nose gear strut.

(2) Installation - Nose Wheel Fork Assembly

(a) Acquire necessary tools, equipment, and supplies.

<table>
<thead>
<tr>
<th>Description</th>
<th>P/N or Spec.</th>
<th>Supplier</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grease</td>
<td>ASG22</td>
<td>Aeroshell</td>
<td>Lubrication.</td>
</tr>
<tr>
<td>Isopropyl Alcohol</td>
<td>99% or higher purity</td>
<td>Any Source</td>
<td>Cleaning agent.</td>
</tr>
<tr>
<td>Calibrated Spring Scale</td>
<td>5A354</td>
<td>Chatillon Kew Gardens, NY 11415 718-847-5000</td>
<td>Load determination.</td>
</tr>
</tbody>
</table>

(b) Remove contaminates from spindle threads using wire brush and isopropyl alcohol.
(c) Place nose wheel fork assembly and thrust washer into installation position.

**CAUTION:** Ensure Teflon coating (dark grey color) on thrust washer faces upward.

(d) Serials 1005 thru 1885 before SB 2X-32-18: Coat spindle threads with thin coat of grease.
(e) Serials 1886 & subs, Serials 1005 thru 1885 after SB2X-32-18: Coat Belleville washers and spindle threads with thin coat of grease.

**CAUTION:** Ensure Belleville washers are installed in correct orientation. Failure to comply with this caution may result in nose wheel shimmy.

Do not allow grease to come in contact with spindle cup bearing surface or nose wheel fork bearings. Failure to comply with this caution may result in nose wheel shimmy.

(f) Install flat washers and Belleville washers in correct orientation.
(g) Secure nose wheel fork assembly with castellated spindle nut.
(h) Perform Adjustment/Test - Nose Wheel Fork Assembly. *(Refer to 32-20)*
(i) Lower airplane off jacks. *(Refer to 07-10)*
(j) Install nose gear fairing. *(Refer to 32-20)*

(3) Adjustment/Test - Nose Wheel Fork Assembly

(a) Remove nose gear fairing. *(Refer to 32-20)*
(b) Raise airplane on jacks *(Refer to 07-10)*
(c) Remove cotter pin securing castellated spindle nut to nose gear strut.
(d) Attach spring scale to axle on nose wheel fork assembly and torque castellated spindle nut so a constant force of more than 49 lbs (22.2 kg) is required to rotate nose wheel fork and wheel assembly.
(e) Loosen castellated spindle nut.
(f) Attach spring scale to axle on nose wheel fork assembly and torque castellated spindle nut so a constant force of 20 - 25 lbs (9.1 - 11.3 kg) is required to rotate nose wheel fork and wheel assembly.

**CAUTION:** To ensure nose gear security, use a new cotter pin on reinstallation.

**Note:** *Serials 1005 thru 1885 before SB 2X-32-18:* After torquing the castellated spindle nut, the cotter pin installation holes may be aligned so that the cotter pin can not be installed. Tightening the castellated spindle nut to facilitate cotter pin installation may result in an over-torqued condition. Loosening the castellated spindle nut to facilitate cotter pin installation may result in nose wheel shimmy due to an under-torqued condition. If cotter pin can not be installed with castellated spindle nut at specified torque, perform Approved Repairs - Nose Wheel Fork Assembly. *(Refer to 32-20)*

(g) Secure nut with new cotter pin. Bend cotter around castellated spindle nut as shown. *(See Figure 32-205)*

**CAUTION:** Do not allow grease to come in contact with spindle bearing surface or nose wheel fork bearings. Failure to comply with this caution may result in nose wheel shimmy.

(h) Apply a thin coat of grease to exposed spindle threads.

(i) Lower airplane off jacks. *(Refer to 07-10)*

(j) Install nose gear fairing. *(Refer to 32-20)*

(4) Inspection - Nose Wheel Fork Assembly *(See Figure 32-205)*

(a) Remove nose wheel fork assembly. *(Refer to 32-20)*

**Note:** If 10% or more of anodizing is still present and lower surfaces of spindle cup flange and spindle cup show no signs of deformation or gouging, the spindle cup may be reused. Otherwise replace the spindle cup.

(b) Inspect lower surface of spindle cup flange for signs of wear, deformation, gouges or deep scratches.

**Note:** If some of the teflon is still present and thrust washer shows no deformation or gouging, the thrust washer may be reused. Otherwise replace the thrust washer.

If bearing shows no deformation or gouging, the bearing may be reused. Otherwise replace the bearing.

If dowel pin or thrust washer is deformed or if locator hole in thrust washer is worn oblong, call Cirrus Design Customer Service for a nose wheel fork assembly replacement.

(c) Inspect dowel pin and thrust washer for signs of wear, deformation, and gouges.

(d) Install nose wheel fork assembly. *(Refer to 32-20)*
NOTES

⚠ Keep Belleville washers free of lubricants.

Serials 1005 thru 1877, 1879 thru 1885 before SB 2X-32-18.
NOTES

⚠ Coat Belleville washers with thin coat of grease.

Serials 1878, 1886 & subs,

Figure 32-205
Nose Wheel Fork Assembly - Serials 1005 thru 1885 after SB2X-32-18, 1886 & subs (Sheet 2 of 2)

LEGEND
1. Spindle Cup
2. Thrust Washer
3. Bearing
4. Flanged Bearing
5. Large Area Washer
6. Belleville Washers
7. Washer
8. Castellated Spindle Nut
9. Cotter Pin

EFFECTIVITY:
Serials 1005 thru 1885 after SB2X-32-18, 1886 & subs

15 Dec 2014
NOTES

▲ Ensure centerline of spindle cup is aligned correctly.

▲ Attach spring scale to axle.

▲ Torque castellated spindle nut so a constant force of more than 49 lb (22.2 kg) is required to rotate nose wheel fork and wheel assembly. Loosen castellated spindle nut and re-torque so a constant force of 20-25 lb (9.1-11.3 kg) is required to rotate nose wheel fork and wheel assembly.

▲ Install new cotter pin as shown.
I. Spindle Cup (See Figure 32-205)

(1) Removal - Spindle Cup
   (a) Remove nose gear strut. (Refer to 32-20)
   (b) Remove nose wheel fork assembly. (Refer to 32-20)
   (c) Remove grease and other contaminates from nose gear strut weldment.
   (d) Determine centerline of existing spindle cup with vernier caliper. Reference centerline by
        making a mark on nose gear strut weldment.
        
        **Note:** If required, tap on spindle cup flange until it falls free from nose gear strut
        weldment.
   (e) Use a heating tip and oxyacetylene torch to quickly heat entire spindle cup for approxi-
        mately 30 - 45 seconds.

(2) Installation - Spindle Cup
   (a) Acquire necessary tools, equipment, and supplies.
   (b) Remove remaining adhesive with 80-grit sandpaper.
   (c) Solvent clean bonding surfaces of nose gear strut weldment and new spindle cup with
        MEK.
   (d) Determine and mark centerline of new spindle cup with vernier caliper and indelible
        marker.
   (e) Mix paste adhesive thoroughly. Apply generously over entire nose gear strut weldment
        bond surface.
        
        **Note:** Ensure reference marks are aligned and spindle cup is completely pushed
        onto the nose gear strut weldment.
   (f) Slide new spindle cup onto nose gear strut weldment.
   (g) Wipe off excess adhesive.
   (h) To prevent spindle cup from sliding down while adhesive is setting up, place base of old
        spindle cup against base of new spindle cup and temporarily secure with castellated nut.
   (i) Cure adhesive for 2.5 hours at 120 - 180 °F (49 - 82 °C). (Refer to 51-20)
   (j) After adhesive is cured, remove and discard old spindle cup and castellated nut.
   (k) Install nose wheel fork assembly. (Refer to 32-20)
   (l) Install nose gear strut. (Refer to 32-20)

(3) Approved Repair - Spindle Stud Replacement (See Figure 32-207)
This repair may be used to replace a damaged spindle stud on the nose gear assembly.

(a) Acquire necessary tools, equipment, and supplies.

<table>
<thead>
<tr>
<th>Description</th>
<th>P/N or Spec.</th>
<th>Supplier</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methyl Ethyl Ketone (MEK)</td>
<td>78-93-3</td>
<td>Any Source</td>
<td>Cleaning agent.</td>
</tr>
<tr>
<td>Paste Adhesive</td>
<td>50195-001</td>
<td>Cirrus Design</td>
<td>Bond spindle cup.</td>
</tr>
<tr>
<td>Serials 1005 thru 1885:  Spindle Stud Replacement Kit</td>
<td>70229-002</td>
<td>Cirrus Design</td>
<td>Replace spindle and attaching parts.</td>
</tr>
</tbody>
</table>
(b) **Serials 2065 & subs:** Remove engine cowling. *(Refer to 71-10)*

(c) Remove nose gear strut. *(Refer to 32-20)*

(d) Remove spindle cup. *(Refer to 32-20)*

**CAUTION:** Do not remove any material from surface of spindle when cutting stud from nose gear assembly spindle. Spindle surface at stud perimeter must remain flat.

(e) Using die grinder, cut existing stud from nose gear assembly spindle.

**CAUTION:** Do not clamp nose gear assembly at spindle radius or welded transition zone.

(f) Insert nose gear assembly spindle into vise clamp with spindle positioned vertically, supporting remaining nose gear assembly as required.

(g) Prior to drilling, verify location of drill to center of spindle meets positional tolerance of 0.025 inch and orientation of spindle meets parallelism tolerance of 0.010 inch. *(See Figure 32-207)*

(h) Drill and tap 5/8-18 UNF-3B hole at center of spindle.

(i) Verify length of drilled installation hole is 1.100 +0.000/-0.005 inch (27.94 +0.000/-0.127 mm).

(j) Using compressed air, remove any debris from spindle.

(k) Solvent clean spindle hole with MEK.

(l) At installation end of spindle stud, apply threadlocker to spindle stud threads.

(m) Install spindle stud into drilled hole on nose gear assembly spindle. Fully bottom out stud and torque to 480 - 690 in-lb (54.2 - 77.9 Nm).

(n) Remove nose gear assembly from vise clamp.

(o) Insert nose gear assembly leg into vise clamp with spindle positioned horizontally.
(p) Measure 0.5 inch (12.7 mm) from end of spindle and mark.
(q) Using 0.250 +0.006/-0.000 inch drill bit at mark, drill hole through centerline of spindle and stud assembly.
(r) Install spring pin into drilled hole.
(s) Verify both ends of spring pin are recessed from the spindle outside diameter.
(t) Remove and discard existing nose gear assembly bushings.
(u) Using arbor press, install replacement bushings to nose gear assembly.
(v) Install spindle cup. (Refer to 32-20)
(w) Install nose gear strut using replacement attaching hardware. (Refer to 32-20)
(x) Serials 2065 & subs: Install engine cowling. (Refer to 71-10)
NOTE

⚠️ Using die grinder, cut existing stud from nose gear assembly spindle.

⚠️ Do not remove any material from surface of spindle when cutting stud from nose gear assembly spindle. Spindle surface at stud perimeter must be flat to remain flush with spindle cup.

⚠️ Do not clamp nose gear assembly at spindle radius or welded transition zone.

⚠️ Drill and tap 5/8-18 UNF-3B hole at center of spindle.

⚠️ Verify length of drilled installation hole is 1.100 +0.000/-0.005 inch (27.94 +0.000/-0.127 mm).

LEGEND

1. Nose Gear Strut

Figure 32-207
Approved Repairs - Nose Gear Assembly Spindle Stud (Sheet 1 of 2)
NOTE

At installation end of spindle stud, apply threadlocker to spindle stud threads.

Install spindle stud into tapped hole on NLG assembly spindle. Fully bottom out stud and torque to 480 - 690 in-lb (54.2 - 77.9 Nm).

Measure 0.5 inch (12.7 mm) from end of spindle and mark.

Using 0.250 +0.006/-0.000 inch drill bit at mark, drill hole through centerline of spindle and stud assembly.

Figure 32-207
Approved Repairs - Nose Gear Assembly Spindle Stud (Sheet 2 of 2)
(4) Approved Repairs - Spindle Stud Cotter Pin Installation Hole - Serials 1005 thru 1475 before SB 2X-32-18 (See Figure 32-208)

This repair may be used to add a second cotter pin installation hole through the threaded portion of the spindle stud. The new cotter pin installation hole will be perpendicular to the original installation hole and will allow a finer degree of adjustment when securing the spindle nut.

(a) Procedure - Repair Method #1

1. Acquire necessary tools, equipment, and supplies.

<table>
<thead>
<tr>
<th>Description</th>
<th>P/N or Spec.</th>
<th>Supplier</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross Hole Tool</td>
<td>16473-001</td>
<td>Cirrus Design</td>
<td>Drill installation hole.</td>
</tr>
<tr>
<td>Drill Bit</td>
<td>0.125 inch (3.2 mm)</td>
<td>Any Source</td>
<td>Drill installation hole.</td>
</tr>
<tr>
<td>Compressed Air</td>
<td>-</td>
<td>Any Source</td>
<td>Remove metal chips from nose gear strut.</td>
</tr>
</tbody>
</table>

2. Remove nose wheel fork assembly. (Refer to 32-20)
3. Perform Inspection - Nose Wheel Fork Assembly. (Refer to 32-20)
4. Install upper cross hole tool onto spindle stud and tighten until snug.
5. Align lockout hole on lower cross hole tool with cotter pin installation hole on nose gear strut.
6. Install lockout pin.

Note: If position of lockout pin interferes with tightening handle, reinstall lockout pin on opposite side of cross hole tool.

7. Tighten lower cross hole tool to upper cross hole tool.

Note: Ensure drill bit passes completely through nose gear strut and not just to void from original installation hole.

8. Using 0.125 inch (3.2 mm) drill bit and guide hole on lower cross hole tool, drill new cotter pin installation hole through nose gear strut.
9. Remove lockout pin.
10. Loosen and remove lower cross hole tool from upper cross hole tool.
11. Using compressed air, remove metal chips from drilled installation hole and threaded portion of nose gear strut.
12. Remove upper cross hole tool from nose gear strut.
13. Verify distance from center of drilled installation hole to bottom of spindle cup is 0.655 ±0.020 inch (1.66 ±0.05 cm).
14. Install nose wheel fork assembly. (Refer to 32-20)

(b) Procedure - Repair Method #2

1. Acquire necessary tools, equipment, and supplies.

<table>
<thead>
<tr>
<th>Description</th>
<th>P/N or Spec.</th>
<th>Supplier</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross Hole Tool</td>
<td>16585-001</td>
<td>Cirrus Design</td>
<td>Drill installation hole.</td>
</tr>
</tbody>
</table>
2 Remove nose wheel fork assembly. (Refer to 32-20)
3 Perform Inspection - Nose Wheel Fork Assembly. (Refer to 32-20)
4 Position cross hole tool lower attach block onto spindle stud.
5 Align lockout hole on lower attach block with cotter pin installation hole on nose gear strut.
6 Install lockout pin.
7 Position cross hole tool so that upper attach block rests on top of spindle cup flange and against nose gear strut.
8 Tighten bolts and washers securing cross hole tool to nose gear strut.

**Note:** Ensure drill bit passes completely through nose gear strut and not just to void from original installation hole.

9 Using 0.125 inch (3.2 mm) drill bit and guide hole on cross hole tool, drill new cotter pin installation hole through nose gear strut.
10 Remove lockout pin.
11 Loosen bolts and washers securing cross hole tool to nose gear strut.
12 Remove cross hole tool from nose gear strut.
13 Using compressed air, remove metal chips from drilled installation hole and threaded portion of nose gear strut.
14 Verify distance from center of drilled installation hole to bottom of spindle cup is 0.655 ±0.020 inch (1.66 ±0.05 cm).
15 Install nose wheel fork assembly. (Refer to 32-20)
REPAIR METHOD #1:

NOTE

⚠️ Install upper cross hole tool onto strut. Tighten until snug.

⚠️ Align lockout hole on lower cross hole tool with cotter pin installation hole on strut. Install lockout pin. Tighten lower cross hole tool to upper cross hole tool.

⚠️ Using 1/8" drill bit and guide hole on lower cross hole tool, drill new cotter pin installation hole through strut.

⚠️ Remove lower cross hole tool. Remove metal chips from strut. Remove upper cross hole tool from strut.

⚠️ Verify distance from center of drilled installation hole to bottom of spindle cup is 0.655 ±0.020 inch (1.66 ±0.05 cm).

Figure 32-208

Approved Repairs - Spindle Stud Cotter Pin Installation Hole - Serials 1005 thru 1475 (Sheet 1 of 2)

EFFECTIVITY:

Serials 1005 thru 1475
Figure 32-208
Approved Repairs - Spindle Stud Cotter Pin Installation Hole - Serials 1005 thru 1475 (Sheet 2 of 2)

EFFECTIVITY:
Serials 1005 thru 1475

31 May 2011
J. Nose Wheel Fork Bearings

(1) Removal - Nose Wheel Fork Bearings
   (a) Remove nose wheel fork assembly. (Refer to 32-20)
   (b) Remove bearings from nose wheel fork assembly.

(2) Installation - Nose Wheel Fork Bearings
   (a) Acquire necessary tools, equipment, and supplies.
   
<table>
<thead>
<tr>
<th>Description</th>
<th>P/N or Spec.</th>
<th>Supplier</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arbor Press</td>
<td>-</td>
<td>Any Source</td>
<td>Install bearings.</td>
</tr>
</tbody>
</table>

   (b) Using arbor press, install bearings to nose wheel fork assembly.
   (c) Install nose wheel fork assembly. (Refer to 32-20)